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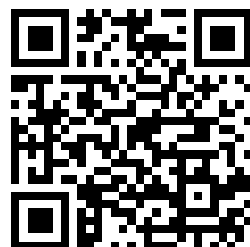
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ADDRESSES AND ORIGINAL ARTICLES

THE THERAPEUTIC ACTION OF IRON

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IRON is present in the food in the simple form of soluble iron salts and compounds of iron hydroxide with protein, and also in the complex form of hæmin derivatives—hæmoglobin, cytochrome, and other respiratory ferments of a porphyrin structure. Feeding experiments on animals indicate that only about half the iron in the food can be assimilated. The available iron of the food seems to correspond closely with the simple forms of iron, which can be estimated by chemical reactions such as Hill's dipyrindil method. Hæmin derivatives do not give these reactions, and they appear to escape absorption in the alimentary tract. Practically all of the iron of simple inorganic salts is available, and preparations such as ferric chloride, when accompanied by traces of copper, can be used as the sole source of iron in the diet of experimental animals. It appears that all compounds of iron must be broken down into simple salts before the iron can be assimilated, and that the hæmin compounds resist this process, so that their iron is not available to the organism.¹³

Iron is absorbed chiefly in the duodenum but the stomach and the whole of the small intestine may take part in the process. The upper part of the alimentary tract is an all-important area in hæmopoiesis and the surgeon should avoid too ruthless an exploitation of this territory. The body of the stomach secretes pepsin and the powerful mineral acid, hydrochloric acid, which is the solvent for the available iron of the food. So abundant is the gastric secretion in health that it more than suffices to neutralise the alkaline juices of the liver, the pancreas, and the intestine, and the reaction of the whole of the small intestine is acid. The pyloric portion of the stomach and the upper duodenum secrete a ferment which reacts with an extrinsic factor in the food to produce the liver principle. The duodenum is the chief site of iron absorption. The available iron of the food is probably reduced to the bivalent ferrous state in the alimentary tract, and after absorption it is either stored or transported to those places where it is required for its catalytic action and for the building of hæmoglobin. Iron is taken up by the nuclei of the erythroblasts, which elaborate hæmoglobin from it and are extruded from the ripening cell when their task is completed. Iron is also taken up by the other cells of the organism for the manufacture of cytochrome and other respiratory ferments. However administered, iron is excreted by the cæcum and large intestine, and little appears in the urine even when iron is introduced parenterally (Fig. 1).

We might expect to find that in health the absorption of iron by the stomach and small intestine would be equalised by the loss through the colon. Whether there is such an equilibrium, and, if so, how it is adjusted, are matters on which at present we have no trustworthy information. The administration of iron to normal animals and men does not affect the blood count, but much of the iron may be retained in the body. Absorption is proved by the rise in the serum iron, by the toxic effects of high dosage of iron in animals, by the investigation

of patients with ileal fistulæ, and by balance experiments. The estimation of iron in animal tissues and excretions is so difficult and the results of analyses of standard biological materials such as milk and serum are so divergent, that we can place no great reliance on the records of balance experiments. Lintzel, experimenting on healthy individuals, concluded that not more than 17 mg. of iron was retained,

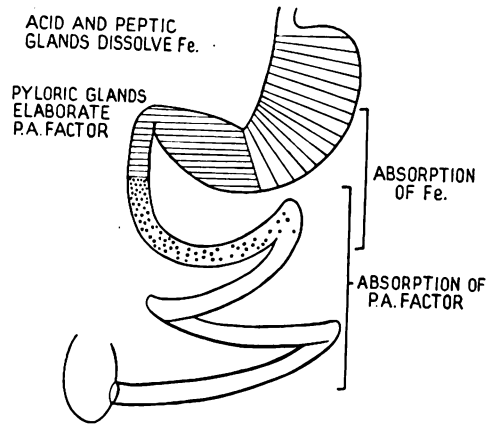


FIG. 1.—The hæmopoietic Area of the alimentary tract.

however large a single dose was given. He assumed that there was an intestinal barrier to the absorption of iron, and stated that there was no advantage in prescribing more than 50 to 100 mg. of iron a day. His results are at variance with experience in the treatment of anæmia, for the hæmoglobin increment may correspond with a utilisation of 50 mg. or more of iron a day, and maximum improvement may not occur until large doses of iron are given. Moreover, Reimann and Fritsch gave patients with anæmia 100 mg. of iron a day and found that approximately 50 mg. a day was retained; only about 20 mg. a day could be attributed to the manufacture of hæmoglobin and the remaining 30 mg. were stored in the body. At the 1935 meeting of the Association of Physicians J. F. Brock reported iron retention of this order occurring for many weeks in patients receiving large doses of iron, so that a subsequent speaker was constrained to say that the patients must be converted into pillars of iron. If these results are confirmed we must believe that patients treated with iron store the metal, in amounts as large or larger than those found in hæmochromatosis, without developing siderosis of the organs; and as anæmic patients treated with large doses of iron may quickly relapse on omitting iron, we must believe that the iron they have sequestered (? in the bones) is a frozen credit which they cannot liquefy. Hæmochromatosis, on the other hand, is probably the result of an inborn error of metabolism which affects the disposal of endogenous and not exogenous iron.⁴⁰

Two other curious facts may also be mentioned. The first is described by Schulten as the "threshold phenomenon." We may, for example, treat a patient for many weeks with a daily dose of 30 grains of iron and ammonium citrate with no apparent effect; on raising the dose to 60 grains of iron and ammonium citrate a day there is a reticulocyte crisis and the anæmia is steadily repaired. Thus there is a minimal effective dose of iron. In other patients who are treated with a suboptimal dose of iron (which is

far larger than any diet could supply) the anæmia may improve for a few weeks and then become stationary at a higher but still subnormal level. In both these conditions it is difficult to explain why the anæmia does not slowly but steadily improve.

Iron Requirement

The professional fasting men, Cetti and Breithaupt, excreted about 10 mg. of iron a day during their periods of starvation, but the excretion of iron is abnormal during fasting owing to tissue breakdown. Lintzel showed that adult males can be balanced on a diet containing less than 1 mg. of iron a day, but much more iron is needed by the growing child and by the female during her reproductive life. The iron requirement in childhood has been estimated at 0.76 mg. per 100 calories of food ingested.⁴ In the female the reproductive function imposes an extra strain on the iron metabolism. Normally about four ounces of blood are lost at each period, or 50 mg. of iron, but in menorrhagia as much as 200 mg. may be lost.⁷ During pregnancy a total of 0.9 gramme of iron must be supplied from the food or the body reserves, or an average daily storage of 3.2 mg.⁸ Under fairly ideal conditions of diet and well-being, it seems possible for the maternal organism to assimilate enough iron for this purpose, assuming that the diet contains 15 to 20 mg. of iron a day, that half of this iron is "available," and that half of the available iron is absorbed. During lactation from 1 to 1.5 mg. of iron a day are secreted in the milk. Reproduction is a test not only of the maternal constitution but also of the standard of living, and a large section of the British community comes through the test badly. Davidson and co-workers have shown that diets averaging 11 mg. of iron a day, such as are taken by the poor in the Aberdeen area, are insufficient to maintain iron equilibrium in females who have begun to menstruate.

In addition to the physiological states which increase the requirement of iron, there are pathological conditions which impair its absorption and give rise to a "conditioned deficiency." The most important is achlorhydria. Impairment of the gastric secretion is found in a high proportion of cases of nutritional anæmia in infancy and childhood,^{1 18} idiopathic hypochromic anæmia,¹⁷ and hypochromic anæmia of pregnancy.⁴⁴ A diet high in iron usually has little demonstrable effect on simple achlorhydric anæmia, but if the food is predigested with hydrochloric acid and pepsin there may be a favourable response.^{2 9 26} The optimum dosage of ferrum redactum and of iron and ammonium citrate is higher in patients with achlorhydria than in those with normal gastric secretions.^{3 19 30 35 39 47} The most intractable examples of anæmia occur in patients in whom the gastric secretion has been reduced and the hæmopoietic area of the stomach and duodenum has been side-tracked by gastrectomy or gastroenterostomy. These cases seem to depend not so much on an acidity—in many of them the secretion of acid persists in spite of operation—as on a hurried passage through the jejunum, and they are associated with severe general impairment of the digestive powers and consequent modifications of the diet.¹⁶ In fatty diarrhœa also the action of iron is much diminished.

Potentialion and Antagonisation of Iron

The therapeutic action of iron can be enhanced by certain procedures which facilitate the absorption or the utilisation of iron. Bethell and co-workers showed that a dosage of 300 mg. a day of ferrum

redactum was ineffective when given in three divided doses of 100 mg. but was effective when given in ten divided doses of 30 mg.; this seems to be a pure absorption phenomenon. In experimental animals iron can be absorbed and stored in the liver but cannot be converted into hæmoglobin unless copper is also present³⁷; this is apparently a pure utilisation phenomenon. It is difficult to demonstrate the action of copper in man, in whom deficiency of copper is excessively rare. Pyrrole derivatives such as bile pigment,³⁴ chlorophyll, and the cytochrome of yeast^{32 33} potentiate the action of iron, probably by facilitating its conversion into hæmoglobin. Other examples of potentiation are more complex. The beneficial effect of the simultaneous ingestion of acid, in the form of hydrochloric acid or of buffered acid media,³⁷ is most simply demonstrated in patients with achlorhydria, in whom the acid acts by replacing the gastric secretion and facilitating absorption, but there is also evidence to suggest that iron is conserved in the body by an acid diet and that its excretion is increased by an alkaline diet.³⁶ The potentiating action of liver is highly complex, as liver is an acid food and a source of additional iron, copper, and pyrrole derivatives.³¹ Calcium is said to have an iron-sparing action,^{40 42 45} by which one must suppose promotion of absorption is meant, but the evidence is scanty, and in experiments on animals the reverse effect has been observed, rats becoming extremely anæmic on a high calcium diet.⁴¹ Apart from this last observation, which is of doubtful human application, the only example of antagonism to iron I have met is Lintzel's statement that citric, tartaric, lactic, and similar acids diminish the absorption of iron, on which account he believes that large amounts of fruit, such as apples, oranges, and lemons, should be forbidden in anæmia. The potentiation of iron must always be borne in mind in experiments designed to estimate the effective dosage of preparations. It is of little immediate therapeutic importance, as these adjuvant actions can only be demonstrated when suboptimal amounts of iron are given, and with rare exceptions hypochromic anæmia in man can always be repaired by massive doses of iron. On the other hand, the potentiation of iron is of the utmost importance to nutrition, because foods rich in available iron, such as meat and eggs, are costly, and diets should therefore be designed to ensure the utmost utilisation of the iron they contain. This is a direction in which we may look forward to further acquisitions of knowledge.

Dosage of Different Preparations of Iron

So far I have spoken of the therapeutic action of iron without making distinctions, but I hope to show that the various preparations of iron differ in therapeutic efficiency just as much as one star differs from another in brightness. One of our chief preoccupations in the study of anæmia has been the determination of the most suitable preparations of iron to be prescribed and the optimum dosage. It will be apparent from what has already been said that the assessment of the therapeutic action of iron requires carefully controlled conditions. Man is the most suitable animal for such experiments, not merely because of his large size or the facility with which his blood may be examined and his excreta collected, nor because his benefit is our ultimate goal. Indeed a study of the literature suggests that governments are more interested in preventing iron deficiency in their domestic animals than in their human populations. But man is peculiarly liable to suffer from a pure

and uncomplicated iron deficiency which can be completely corrected by the administration of inorganic salts of iron. In this country work on nutritional anæmia of infancy and idiopathic hypochromic anæmia was considerably influenced by McGowan's observations on iron deficiency in sucklings and sheep. With this notable exception work on animals has rarely been capable of immediate transfer to man. The original denial of the value of inorganic salts of iron; the subsequent equalisation of all inorganic salts of iron; the recommendation of whole liver and secondary liver extract in hypochromic anæmia; the emphasis on the action of copper—none of these has been directly applicable to man.

Iron is administered internally in medicine for its hæmatinic action and for its tonic or roborant action. My further remarks will be confined to its action in anæmia, though the presence of iron in every living cell suggests that its use in debility and in disease of the central nervous system is not without a theoretical basis. In the anæmias which respond to iron the red cells are paler and usually smaller than normal. Certain anæmias of this type, when left untreated, may persist almost unchanged for years. They respond dramatically to iron and are therefore an ideal subject for experiment. The most important examples are idiopathic hypochromic anæmia, with which I include chlorosis, and the anæmia of hook-worm disease. Certain chronic hæmorrhagic anæmias may also exhaust the ability to improve spontaneously and be suitable test-objects provided further hæmorrhage can be excluded. The criteria on which we select patients for experiment on the action of iron are as follows:—

1. The anæmia should be one of the torpid and hypochromic anæmias which I have mentioned.

2. Patients who have suffered from hæmorrhage or have recently been treated are unsuitable unless an adequate control period has shown no tendency to improve.

3. Infection, toxæmia, malignant disease, pregnancy, old age, and damage to vital organs such as the liver, the kidneys, and the thyroid, all impair the response to iron and render the case unsuitable.

4. The initial hæmoglobin level should not exceed 50 per cent., or else the reticulocyte response will be too small to be utilised and the hæmoglobin gain will not be comparable with that of the severer grades of anæmia.

5. The state of the gastric secretion should be known. Achlorhydria should not exclude the patient and is in fact an advantage, as anæmia is so often complicated by achlorhydria. Short-circuiting operations and severe functional disturbances of the alimentary tract such as steatorrhœa render the patient unsuitable.

6. The diet and mode of life should be constant throughout the period of observation.

In the pharmacopœia of the future the dosage of drugs will doubtless be given per kilogramme of body-weight and by mathematical formulæ or diagrams which express individual variations in therapeutic, toxic, and lethal reaction. At present there is neither the knowledge to compile nor the ability to use such a formulary, but it is well to remember that the customary method of stating doses gives little indication of the infinite variety of mankind in its response to medication. Some women with simple achlorhydric anæmia improve rapidly on as little as 15 grains of iron and ammonium citrate a day, others may need 150 grains. I shall therefore speak only of the average effective dose. The "single reticulocyte crisis" is not very helpful in determining average effective doses of preparations of iron, as the reticulocytoses in hypochromic anæmia are of a lower order and less constant than those of

pernicious anæmia.^{20 30} I will refer to the use of the "double reticulocyte response" later. Most use has been made of the "rate of hæmoglobin increase." The curve representing the rise of hæmoglobin during treatment has a sigmoid shape, there being an initial lag, a subsequent steady rise, and a final slowing in the rate of hæmoglobin regeneration as the normal level is approached. The maximum effect of treatment occurs between the second and fourth weeks, and the increase of hæmoglobin should therefore be estimated over a period of not less than 25 and not more than 40 days from the initiation of treatment.¹⁵ It has been found by experience that the rate of hæmoglobin regeneration in man rarely exceeds 2 per cent. a day. The "average effective dose" of a preparation of iron may be defined as the dose which produces an average increase of over 1 per cent. of hæmoglobin a day in a sufficiently large sample of patients with achlorhydria and anæmia, when the initial hæmoglobin level does not exceed 50 per cent., and when the period of observation is not less than 25 and not more than 40 days. The analyses of Heath and Fullerton show that about 60 per cent. of such a series of patients will gain more and 40 per cent. will gain less than 1 per cent. of hæmoglobin a day, but the mode of the series will be just over 1 per cent. In the accompanying Table I have summarised from my own experience and from the literature the average effective daily dose of the common preparations of iron.

TABLE showing average effective dose of common preparations of iron, and percentage of iron administered utilised for hæmoglobin formation.

Preparation.	Daily dose in grammes or c.cm.	Iron content in mg.	Utilisation (per cent.).
Metallic—			
Ferrum redactum ^{3 33 33}	1.5 to 6.0	1200 to 5000	0.5 to 2.0
Ferrous—			
Ferrous chloride ^{10 35}	0.25 to 0.5	100 to 200	12.5 to 25
Ferrous sulphate exsic. ¹⁵	0.6	180	14
Ferrous lactate ²⁸ ..	1.5	300	8
Pil. ferri carb. (Blaud) ^{30 31 47}	3.0 to 4.0	300 to 400	6 to 8
Ferric—			
Liq. ferri perchlor. ..	8.0	400	6
Ferric citrate ³⁵ ..	2.0	400	6
Iodoan (ferric hydrox.) ²⁹	30 to 45	1500 to 2250	1.1 to 1.7
Soluble ferric oxide ³⁵	35	1000	2.5
Complex ferric—			
Fe et ammon. cit. ^{31 47}	4.0 to 8.0	800 to 1600	1.5 to 3.0
Injection—			
Inj. Fe B.P. ^{6 20} ..	5.0 to 10.0	16 to 32	100

Organic.—As already indicated, only the non-hæmoglobin-like part of the iron of the food is available, and hæmoglobin and similar compounds do not exert the therapeutic action of iron.

It is obvious that iron is most active when given by injection, but in practice parenteral administration is contra-indicated by its dangers. The therapeutic dose of iron by injection (iron and ammonium citrate equivalent to 32 mg. iron) is so close to the toxic dose (48–80 mg. iron) that effective treatment can hardly be given by this route.^{6 20} I have seen toxic symptoms from the injection of 14 mg. of iron a day in the form of iron and ammonium citrate, which is far less than the effective dose. When iron is given by mouth symptoms of general intoxication, as distinct from intestinal irritation, are most unusual, and in spite of the frequent prescription of enormous doses, only one example of severe intoxication from ingested iron is on record.²¹ The amounts of iron which patients have taken with impunity are very large—150 grains a day of reduced iron ³⁹; 150 grains of Bland's pill a day for two or three months ³⁸; 300 grains of iron and ammonium citrate daily ⁴⁷; and while higher dosage than necessary is unwise

there is no excuse for giving too little. The most important lessons from recent work on iron are the futility of injecting iron and the safety of large doses by mouth.

The therapeutic activity of preparations of iron by mouth is directly proportional to their solubility and to the ease with which they yield free ions of ferrous iron. Metallic iron, colloidal ferric preparations, and the scale preparations, in which the iron is in a complex form and not readily ionised, all require to be given in large doses to produce effects. The soluble ferrous salts are the most active. The average effective dose of ferric chloride has not yet been worked out with any degree of accuracy, but from some uncompleted experiments by N. S. Plummer and myself it must be higher than 400 mg. of iron a day, equivalent to liq. ferri perchlor. minims 40 t.d.s. We have obtained incontrovertible evidence that ferric chloride is less potent than ferrous chloride or ferrous sulphate by the method of the double reticulocyte crisis. In these experiments, after a control period, we have treated the patient for a short time with the equivalent of 200 mg. of iron a day as ferric chloride, and have afterwards given the same amount of iron as ferrous chloride or ferrous sulphate. The higher potency of the ferrous salts is revealed by the occurrence of a second reticulocyte crisis and by an acceleration in the rate of hæmoglobin formation. Similar results have been reported by Reimann and Fritsch. On the other hand it is clear that ferric salts are effective if given in sufficient amounts. Their relative inferiority cannot be explained by precipitation on contact with food residues, as colloidal ferric preparations are less effective than the astringent preparations. It is possible that iron is not absorbed in the ferric valency, and that ferric salts are reduced to the ferrous state in the alimentary tract before absorption; on this account they are less potent than the preformed ferrous preparations (Fig. 2).

The most active preparation of iron is not necessarily the most suitable for prescription, and the choice of a preparation for medicinal use is governed by a number of additional factors such as price, palatability, tolerability, durability, and ease of prescription. The soluble simple salts of iron are all irritating to the stomach. The ferrous salts tend to oxidise in solution, though this may be inhibited by avoiding over-dilution and making up the mixture with glucose and/or acid; if they are given in solid form they may cause vomiting, whilst tablets become

hard and insoluble unless carefully and freshly prepared. The solution of ferric chloride is intensely irritating, and I found it quite impossible to use it in effective doses till I learnt the device of adding it to milk immediately before taking.¹⁴ The massive amounts of iron which must be ingested when reduced iron, colloidal ferric iron, or the scale preparations are used, may cause indigestion, diarrhoea, cramps, and constipation,¹⁹ and even intestinal obstruction.⁴³ There is also evidence that large amounts of unabsorbed iron in the intestine may interfere with the absorption of other minerals^{5 46} and vitamins.⁴ The ideal preparation of iron still awaits discovery, but the following are some useful and cheap prescriptions:—

Ferrous chloride (Howard)	..	..	3 grs.
Syrup	..	..	15 minims
Chloroform water	..	..	to 1 drachm
e lacte, t.d.s., p.c.			
Pil. ferri. carb.	..	..	15 grs.
t.d.s., p.c. To be crushed before taking.			
Iron and ammon. citrate	..	..	30 grs.
Glycerin	..	..	15 minims
Chloroform water	..	..	to 1 oz.
t.d.s., p.c.			

Among proprietary preparations, which are sometimes more highly esteemed by patients on account of their elegance and costliness, one may mention Ferronyl (ferrous chloride), Oppenheimer's Bipalatinoids (ferrous carbonate), and Idozan (ferric hydroxide).

In the Table I have estimated the percentage of the dose of iron administered which is utilised in the manufacture of hæmoglobin when there is an increase of 1 per cent. a day, using the following calculation¹⁵:

Blood iron corresponding to 100 per cent. hæmoglobin = 50 mg. per 100 c.cm.
 Blood volume = 5 litres.
 Thus a rise of 1 per cent. hæmoglobin is equivalent to a gain of 50/100 x 50 = 25 mg. of iron as hæmoglobin.

The utilisation of an average effective dose of ferrous iron is approximately 20 per cent., and if minimum effective doses of ferrous iron are prescribed, between 50 and 100 per cent. of the dose ingested may be utilised for hæmoglobin formation. Reticulocyte crises and repair of anæmia may be observed with a daily dosage as low as 22 mg. of ferrous iron by mouth. The massive dosage of some preparations of iron has led to a good deal of misunderstanding of the mode of action of the metal, but there now seems no doubt that the effective dosage of preparations of iron is

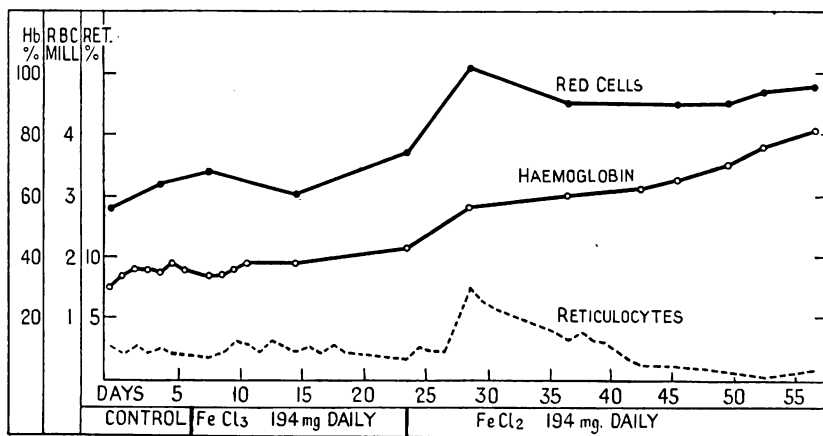


FIG. 2.—Superiority of bivalent ferrous over trivalent ferric chloride when given in doses containing equal amounts of the metal.

directly proportional to the ease with which they yield free ferrous ions. The effective dose of soluble ferrous salts is small and of the same order as the iron contained in the food. The action of iron on the blood-forming organs can be simply explained as the provision of a raw material for the manufacture of hæmoglobin. The administration of iron also relieves the soreness of the tongue and the fissuring at the corners of the mouth, the dystrophy of the nails, the atrophy of the skin, and the bruising and menorrhagia, which often accompany hypochromic anæmia and are probably due to lack of iron in the

tissues. Excess of iron has no influence on hæmopoiesis in health, nor does iron provoke blood formation in the same way as oxygen-want, arsenic, or X rays, so that we are probably correct in assuming that iron is a nutrient and not a stimulant for the blood-forming organs.

To a large extent iron is used to repair deficiencies which would not have occurred had the diet been satisfactory, and as the hygiene and nutrition of the world improve, we may expect conditions such as the "physiological" anæmia of pregnancy, the nutritional anæmia of infancy, and the anæmia of hookworm infestation to follow chlorosis into the limbo of vanished diseases. But the value of diet in anæmia is essentially prophylactic, and when the iron supplies of the organism are exhausted it is hard to replenish them in a reasonable time from the food. We can foretell no decrease in those forms of anæmia which cannot be prevented by diet alone, such as idiopathic hypochromic anæmia and pernicious anæmia, in which the absorption of iron is impaired, and splenic anæmia and chronic hæmorrhagic anæmia, in which excessive amounts of iron are lost. The metal iron is sacred to the god of war, but even in that distant day when swords are beaten into ploughshares, and the peoples of the world are fed not with bread alone, but with diets adequate in biological proteins, vitamins, and minerals, the physician must preserve his skill in the therapeutic use of iron.

Summary

(1) The factors which affect the requirement, the absorption, and the utilisation of iron are discussed.

(2) The absorption of the iron contained in food or drugs is proportional to the ease with which ferrous ions are liberated.

(3) Iron acts as a nutrient and not as a stimulant for the blood-forming organs.

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GASTRIC ACIDITY AND ITS SIGNIFICANCE

A CLINICAL AND EXPERIMENTAL STUDY

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THE literature relating to variations in gastric acidity, and their significance, is vast and conflicting. Standards of normal acidity for healthy people, and for different sexes and ages, have been set up, although every degree of acidity and even achlorhydria are found in perfectly healthy individuals. In this paper an attempt is made to bring together various experimental and clinical facts into a correlated whole, so that we may better understand not only how gastric acid is regulated and variations are produced, but the significance of these changes, and their bearing on general bodily conditions.

The concentration of hydrochloric acid in pure gastric juice has been given different values by many observers. The recent and most careful work of Hollander and Cowgill¹ however shows that the pure parietal juice has an acid concentration of 0.170 N (pH 0.91), a figure which is independent of rate of secretion or type of stimulus. Variations in acidity are brought about by admixture with mucus and solutions of sodium chloride and bicarbonate, secreted by the gastric mucosa and in some cases regurgitated from the duodenum.

We are, however, more concerned here with variations in acidity at various times after a standard meal irrespective of the mechanism by which these changes are brought about.

THE RELATION OF ACIDITY TO BLOOD CO₂

In 1931 Apperly and Crabtree² showed that variations in the CO₂-content of the fasting blood plasma not only governed the acidity of the gastric contents after a test-meal in any one individual, but were also responsible for the differences in gastric acidity between different individuals (Fig. 1). In 1932 Browne and Vineberg³ confirmed these results in

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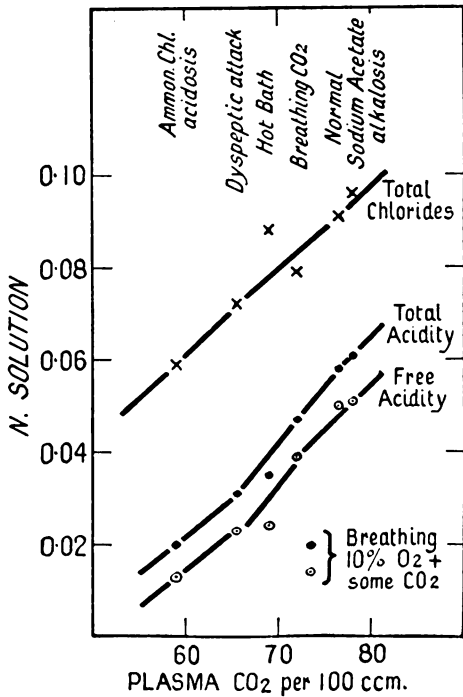


FIG. 1.—Relationship of (a) total chloride, total acidity, and free HCl of gastric contents one hour after the commencement of a test-meal, to (b) the CO₂ capacity of the fasting blood-plasma in one individual under various conditions of acidosis, alkalosis, &c. (from Jour. of Physiol.³).

dogs and further showed that the total amount of acid secreted could be increased or diminished by artificially raising or lowering plasma CO₂.

But what are the factors responsible for variations in plasma CO₂? Does clinical experience show that such variations result in similar variations in gastric acidity? Obviously, of course, the respiratory centre is the immediate regulatory mechanism. But other causes underlie this. Let us therefore correlate what is known about gastric acidity with the conditions in which plasma CO₂ is known to be increased or diminished, and thus possibly obtain some idea as to the significance of these gastric variations. These conditions can be classified thus:—

- (a) Primary CO₂ deficit, commonly associated with some rise of blood pH.
- (b) CO₂ deficit, secondary to loss of blood alkali, associated with fall of pH.
- (c) Primary CO₂ excess, associated with fall of pH.
- (d) CO₂ excess, secondary to rise of blood alkali, associated with rise of pH.

(a) Primary CO₂ deficit is brought about by pulmonary hyperventilation from any cause (except that following respiration of a high CO₂ atmosphere), as for instance by heat, fevers, the earlier stages of oxygen shortage, altitudes, encephalitis, and certain cardiac diseases. The fall of plasma CO₂ following hyperventilation has been shown by Haggard and Henderson;⁴ Collip and Backus,⁵ and Grant and Goldman⁶; that following confinement in a hot room by Cajori⁷; in a hot bath by Bazett,⁸ Kochler,⁹ and Landis¹⁰; and in the tropics by Sundstroem,¹¹ Radsma et al.,¹² and others. The lowering of gastric acidity under each of these conditions has been demonstrated respectively by Delhougne¹³ and Browne and Vineberg³; by Talbert and Rosenberg¹⁴; by Apperly and Semmens¹⁵; and by Nye and Sippe.¹⁶

Apperly¹⁷ was the first to apply the above facts as a possible explanation of the diminished incidence of peptic ulcer in warmer climates when compared with the incidence in people of similar habits in cooler climates. In a survey of the Australian States he showed that peptic ulcer was commonest in Tasmania (latitude 43° O' S) with an incidence of 135 per 1000 hospital beds per year, and that the figures for the various States gradually diminished, as the Equator was approached, to a minimum of about 28 in tropical North Queensland (latitude 21° 10' S). Later Nye and Sippe¹⁶ showed an increased incidence of achlorhydria and hypochlorhydria in Queensland as compared with the cooler southern States, and in summer as compared with winter. This survey is interesting because in Australia we have, spread over a huge area extending from the tropics to mild and even cold zones, an almost pure Anglo-Saxon race with almost exactly similar dietetic and other habits. When we compare different races with different diets of course this relationship to heat and cold no longer holds—e.g., among the cayenne pepper-eating Abyssinians, and the people of Southern India with their highly spiced foods, it is not surprising to find that the incidence of gastric ulcer is unusually high (Bergsma,¹⁸ Bradfield¹⁹).

A further interesting fact is the hypochlorhydria and achlorhydria of fevers whether of natural origin (Glaessner²⁰) or experimentally produced by vaccines (Vanzant²¹), but it is probable that toxic and other factors than the fall of plasma CO₂, consequent on the hyperventilation of pyrexia (Koehler,⁹ Hachen and Isaacs²²) are operating in these cases.

While the effects of X radiation are still open to some doubt, there is considerable evidence that such treatment results in a fall of plasma CO₂ and a rise in pH (Hussey,²³ Kast et al.,²⁴ Myers and Booher²⁵), i.e., changes similar to those following hyperpnœa; but we have no direct evidence of the effects of the above on gastric acidity and motility. It is, however, of interest to note that X radiation reduces hyper-

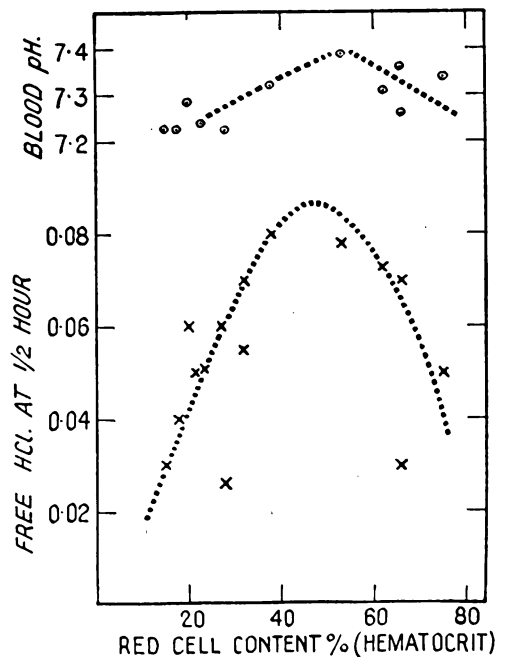


FIG. 2.—Relationship of gastric acidity after a 5 per cent. alcohol "meal" in dogs to red cell content of blood.

acidity, and increases intestinal motility even to diarrhoea (Pohle³⁶).

(b) *Fall of plasma CO₂ secondary to a primary alkali deficit* usually follows loss or neutralisation of plasma alkali by exogenous or endogenous acids.

The simplest case is that in which the ingestion of sufficient ammonium chloride lowers both plasma CO₂ (Haldane,²⁷ Gamble et al.,²⁸ Apperly and Semmens¹⁵) and gastric acidity, with a prolongation of gastric emptying-time (Apperly and Crabtree²). Clinically, the same phenomena are exhibited in the diminished gastric acidity in the later stages of pregnancy (Nakai,²⁹ Davies and Shelly³⁰) in which there is a fall of plasma CO₂ due to alkali deficit (Bock,³¹ MacNider,³² Rowe et al.,³³ and others); by the fall of gastric acidity after severe exercise (Hellebrandt and Miles³⁴) in which lactic acid causes a fall in blood CO₂ (Bock and Dill,³⁵ Boje,³⁶ and others); by the generally lowered acidity in those of poor physical fitness (Bloomfield and Keefer³⁷) in whom there is also usually a lowered plasma CO₂ (Osman and Close³⁸); and by the hypochlorhydria and anacidity of chronic nephritis (Jones,³⁹ Friedenwald and Morrison⁴⁰) in which plasma bicarbonate is so commonly diminished (Henderson, Bock et al.,⁴¹ and many others).

As regards the effects of diabetic acidosis, several text-books state that achlorhydria and hypochlorhydria are commonly found, but I am unable to find any statistics corrected for age and sex to compare with the figures for normal people. It is interesting, however, that insulin increases the secretion of gastric acid (Roholm,⁴² Collazo and Dobreff⁴³), the acidity after a test-meal (de Ancaies⁴⁴), and gastric motility (Dickson and Wilson⁴⁵).

Of the effects on gastric acidity of starvation and the diarrhoeal disease, in both of which plasma bicarbonate is diminished,^{79 80} there appears to be no definite evidence; immediately after starvation there appears to be some diminution of total acid

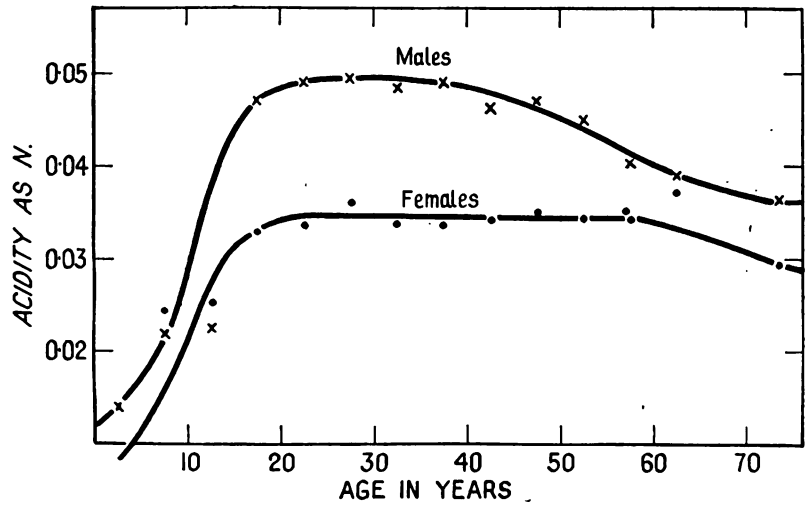


FIG. 3.—Variations of average normal gastric acidity with age and sex (after Alvarez, Vanzant et al.⁵⁴).

secretion in dogs (Kunde⁴⁶) but in man Carlson⁴⁷ could find no such changes.

It is somewhat difficult to place the various anoxæmias in the classification here used. In all cases hyperventilation leads to diminished plasma CO₂, as in hæmorrhage (Bennett,⁴⁸ Buell⁴⁹), at altitudes (Barcroft,⁵⁰ Wittkower,⁵¹ Fitzgerald⁵²), and after breathing a low-oxygen atmosphere (Koehler,⁵³ Haggard and Henderson⁴). Whereas, however, in the early stages the loss of CO₂ directly follows hyperventilation with rise of blood pH—which would tempt us to classify this group under Class (a)—in the later stages lactic acid formation neutralises part of the plasma alkali, with a fall of pH. Most of the cases here discussed fall into the latter group which is therefore classed under (b). In each of the cases mentioned above a lowered gastric acidity has been demonstrated—e.g., at altitudes by Delrue in the case of dogs⁷¹—and by Apperly, Crabtree, and Norris for man (unpublished); after breathing an oxygen-poor atmosphere (Crisler, Van Liere, and Wiles,⁵⁴ Apperly and Crabtree, unpublished); and in some of our own observations following hæmorrhage in both dogs and man. In most of the above instances the stomach emptying-time was retarded.

Fig. 2 shows the results in one of our series of experiments on dogs, in which anæmia and polycythæmia were artificially produced by bleeding and transfusion.⁹¹ It will be seen that gastric acidity rose with red cell content up to a maximum at or slightly above the normal content. (Beyond this, with increasing polycythæmia, acidity fell again. The reasons for this will be dealt with elsewhere.) Similar figures were found in normal and anæmic patients. Not only do we have acidity changes with the grosser forms of anoxæmia, but also corresponding to those variations of hæmoglobin which are within normal limits.

Without going into our

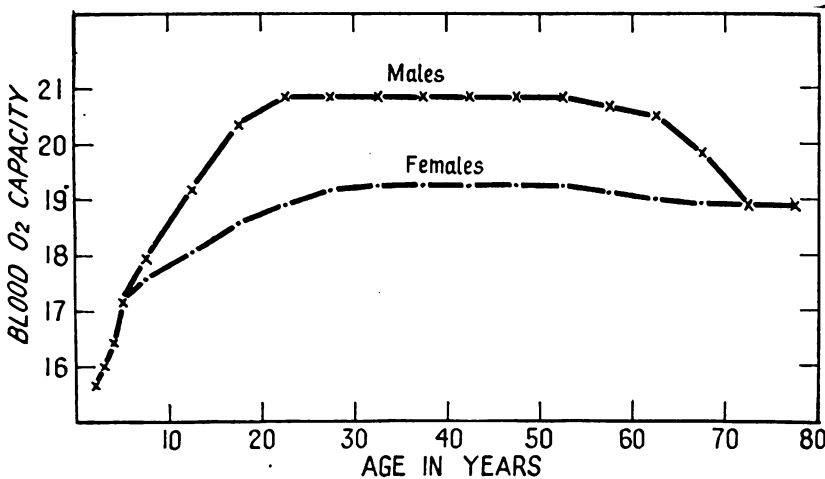


FIG. 4.—Variations of average normal hæmoglobin or oxygen capacity with age and sex (modified from Peters and Van Slyke⁵⁵).

experimental work here, we will merely mention the most interesting and striking similarity between the graph representing the average gastric acidities for different age- and sex-groups (as determined by Vanzant, Alvarez et al. from 3746 cases,⁵⁵ Fig. 3) and the graph showing the average hæmoglobin content of the blood for similar age- and sex-groups (from Peters and Van Slyke,⁵⁶ Fig. 4). Further, when the figures in these two graphs are plotted against each other, a straight line relationship is revealed (Fig. 5). We have of course found a considerable individual scattering about these average curves. These charts suggest two things: (1) that variations in average gastric acidity for different age- and sex-groups are at least

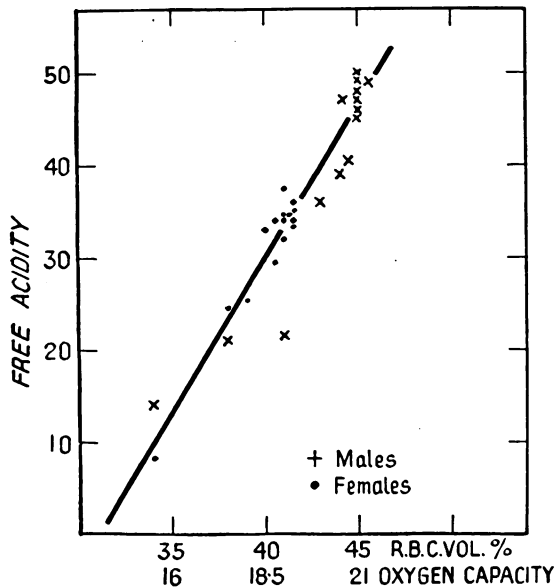


FIG. 5.—Relationship of average gastric acidity of different age and sex groups (taken from Fig. 3) to average hæmoglobin for the same groups (taken from Fig. 4).

partly dependent on hæmoglobin differences, or whatever causes the latter; and (2) that, assuming the straight line in Fig. 5 continues as such to the base-line, gastric acidity disappears when the hæmoglobin content of the blood falls to about two-thirds its normal value—i.e., that anæmia can bring about achlorhydria. We have indeed found this in patients with post-hæmorrhagic anæmia. This observation is of great interest in view of the well-known work of Witts and others on the reverse relationship—i.e., that certain anæmias are preceded and caused by achlorhydria. It would appear that we will have to distinguish between Witts's achlorhydric anæmia and our anæmic achlorhydria. We hope to publish these and other observations in the near future.

Dr. Alvarez has suggested to me that the changes in acidity and motility may explain the fact that the symptoms of peptic ulcer often improve after a severe hæmorrhage.

(c) *Primary CO₂ excess* in the plasma is brought about either by breathing an atmosphere containing an excess of CO₂ gas (Davies et al.⁵⁷), or by any process that interferes with the elimination of CO₂ from the blood—e.g., in emphysema (Scott,⁵⁸ Dautrebande,⁵⁹ Peters et al.⁶⁰), or during an asthmatic attack (Osman and Close,³⁸ Apperly and Norris (unpublished)).

Bakaltschuk⁶¹ and Apperly and Crabtree² showed the rise in acidity brought about by breathing an atmosphere containing 3–5 per cent. CO₂ or by rebreathing one's own CO₂. Johnston and Washeim⁶² showed the same result during sleep, when plasma CO₂ rises, possibly on account of a diminished sensitiveness of the respiratory centre, resulting in CO₂ retention (Endres⁶³).

R. J. Main, in this laboratory, has shown a close linear relationship between alveolar CO₂ per cent. and the ratio of pulmonary vital capacity to body surface (unpublished)—i.e., that healthy large-lunged individuals have a higher alveolar CO₂. Full and Herxheimer⁶⁴ have also found a decidedly higher average alkali reserve in athletes than in untrained men. This high blood alkali or CO₂ in normal people indicates an optimum oxygenation (Gesell⁶⁵). It is therefore not surprising that the big-chested, athletic type of man has, on the whole, a higher gastric acidity than the opposite physical type (Campbell and Conybeare,⁶⁶ Vogeler⁶⁷). Apperly and Semmens¹⁵ demonstrated a rough correlation between gastric acidity and the ratio of pulmonary vital capacity to body-weight.

Another cause of increased plasma CO₂ is constriction of the bronchioles. We have found this in a number of asthmatics during an attack, but of the effect on gastric acidity of bronchiolar constriction brought about, for example, by asthma, noxious gases, and possibly by smoking with inhalation, we know nothing. The hyperchlorhydria of many smokers is generally attributed to the direct effect of swallowed irritants on the gastric mucosa. Possibly an increased bronchiolar constriction, reflex or direct irritation, might be a factor.

(d) *Increased plasma CO₂ secondary to primary alkali excess* has been demonstrated experimentally after the ingestion of large doses of sodium acetate and other alkaline salts by Davies and Haldane,⁵⁷ Palmer et al.,⁶⁸ Gesell and Hertzman,⁶⁹ and others, and clinically during a course of Sippy's diet (Kast,²⁴ Myers and Booher²⁵). That gastric acidity is raised under the same conditions has also been shown by Apperly and Crabtree² and by Hardt and Rivers⁷⁰ respectively. The former also observed an increased gastric motility.

The accompanying Table is a summary of the above observations.

RELATION OF GASTRIC ACIDITY TO BLOOD pH

In the Table Groups (a) and (b) are associated with diminished plasma CO₂ and (c) and (d) with increased plasma CO₂. On the other hand, those conditions in which pH is increased are found in Groups (a) and (d), while (b) and (c) contain those associated with a fall of pH. It will be seen that gastric acidity follows variations in CO₂, but has no relationship to blood pH.

RELATION OF GASTRIC MOTILITY TO BLOOD pH

Although few observations have been made on the relation of gastric motility to blood chemistry, the evidence presented above and summarised in the Table shows that experimental and clinical variations of the plasma CO₂ associated with increased gastric motility fall in Groups (a) and (d), while those associated with a retarded emptying rate fall in Groups (b) and (c). This seems to indicate that blood pH is a factor in determining gastric motility, these two varying in the same direction.

Table showing Relation of Gastric Acidity and Emptying-time to Blood Bicarbonate and pH

Figures denote references

(a) PRIMARY CO₂ DEFICIT

—	Plasma CO ₂	Blood pH.	Gastric acidity.	Gastric motility
	Dim.	Inc.	Dim.	Inc.
Hyperpnoea	4, 5, 6	4, 5, 6	3, 13	..
Hot room	7	7	14	..
Hot baths	8, 9, 10	10	15	15
Tropics	11, 12	12	16	..
Fevers	9, 22	9	20, 21	..
Altitudes	50, 51, 52	50	71, 72	..
Encephalitis	73, 74	73	..	..
X radiation	23, 24, 25	23, 24, 25	..	26
Some cardiac failures without pulm. comp.	75, 76,	..	..	..

(b) PRIMARY ALKALI DEFICIT

—	Dim.	Dim.	Dim.	Dim.
Ingestion of amm. chloride or HCl ..	27, 28, 77, 2	28, 77	2, 3	2
Chronic nephritis ..	41 et al.	41	39, 40	..
Diabetes	78, 25	78, 25	Tk.	..
Severe exercise ..	35, 36, 74	35, 74	34	34
Menstruation	38	..	83	..
Pregnancy	31, 32, 33	No pH changes reported.	29, 30	..
Anoxæmia chronic ..	53, 4	53, 4, 81	54, 72	54, 72
Hæmorrhage severe ..	48, 49	48, 82	Fig. 2.	91
Poor physical fitness	38, 64, 15	..	37	15
Starvation	79	79	46	..
Infantile diarrhoea ..	80	80	..	..
Some cardiac failures near death ..	75	75	..	..

Tk. =Text-book statement.

(c) PRIMARY CO₂ EXCESS *

—	Inc.	Dim.	Inc.	Dim.
Breathing CO ₂ ..	57	84, 85	2, 3, 61	2
Sleep	63	..	62	62
Large $\frac{V.C. \uparrow \text{ or } V.C.}{W. \quad S.}$	86†	87	15, 66	67, 15
Emphysema	58, 59, 60	59	..	..
Asthmatic attacks ..	38, 72	..	..	..
Certain cardiac failures with CO ₂ retention ..	75, 88	75, 88	..	..

* This group is often complicated by anoxæmia, hence may overlap Group (b). † See text. ‡ Alveolar CO₂.

(d) PRIMARY ALKALI EXCESS

—	Inc.	Inc.	Inc.	Inc.
Ingestion of alkaline salts	57, 68, 69, 2	57, 69	2, 3, 89, 90	2
Sippy diet	24, 25	24, 25	2, 70	..
Insulin following diabetic acidosis .. ..	..	..	42, 43, 44	45

Dim. =diminished. Inc. =increased.
Pulm. comp. =pulmonary complications.

PRACTICAL CONSIDERATIONS

The preceding suggest some possible practical applications:—

1. Hyperchlorhydria and the symptoms associated with it might be diminished by, among other things, (i) removal to a warm climate, (ii) artificial fever, (iii) heat treatment, (iv) bleeding, and (v) the substitution of oxides and non-absorbable bicarbonates for the usual sodium bicarbonate treatment, since the latter salt in large amount, by increasing plasma CO₂, may actually raise gastric acidity.

2. Certain of the hypo-acid dyspepsias are more likely to be influenced by attention to the underlying anoxæmia or acidosis than by direct local treatment. A search for the causes of a low plasma CO₂ may be fruitful, since it may give a clue to the underlying pathological conditions.

3. In dealing with cases in which achlorhydria or hypochlorhydria is associated with anæmia, it might be well to investigate which of these conditions is primary—i.e., whether we are dealing with an anæmic achlorhydria or an achlorhydric anæmia (Witts).

SUMMARY

Gastric acidity after a meal is chiefly a function of the blood CO₂. In normal people this is regulated by the hæmoglobin content of the blood, by the ratio of the pulmonary vital capacity to body-weight (or surface), and by temperature. Under abnormal conditions anoxæmia, anæmia, altitudes, pregnancy, nephritis, fevers, diabetes, severe exercise, and lowered physical fitness may diminish plasma CO₂ and therefore gastric acidity. Asthma, emphysema, &c., which raise plasma CO₂, would be expected to raise gastric acidity, while encephalitis, X radiation, and certain cardiac conditions, which lower plasma CO₂, would be expected to lower gastric acidity; but these effects have not been investigated. The acidity of the gastric juice is a rough measure of the alkali reserve of the blood (except in marked anæmia), while the rate of gastric evacuation would seem to be influenced partly, at least, by blood pH. A consideration of the possible causes of such variations of plasma CO₂ and pH may give valuable hints as to the pathological conditions underlying certain dyspepsias.

There is also a direct relationship between the red cell content of the blood and gastric acidity. When the former falls to about half or two-thirds normal (on the average) free acid disappears from the stomach. A distinction is therefore made between the achlorhydric anæmia of Witts and anæmic achlorhydria.

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THE INHIBITORY EFFECT OF FOLLICULAR HORMONE ON THE ANTERIOR LOBE OF THE PITUITARY GLAND

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In previous papers I have been able to determine the following facts. The anterior pituitary is the motor of sexual function. The gonadotropic hormones of the anterior pituitary represent the superior sexual hormones. The anterior lobe stimulates the secretion of (a) folliculin (œstrin) in the theca cells by means of prolán A (follicle-stimulating hormone), and (b) progéstin, in the granulosa cells by means of prolán B (luteinising hormone). Without the anterior lobe there is no folliculin. The follicular hormone, produced in the ovary through the action of the follicle-stimulating hormone (prolán A), reacts in its turn upon the anterior lobe.

The present paper is a preliminary report of experiments in which I have studied the inhibitory effect of the follicular hormone given over long periods in amounts much larger than those ordinarily produced in the body—given, that is to say, as a drug. Elsewhere I shall report the effect of these large doses of follicular hormone on its effector organ, the uterus, and I now propose to describe their effect on the controlling gland, the anterior pituitary.

My first finding is that the harmonic function of the anterior pituitary can be inhibited.

INHIBITION OF THE GROWTH HORMONE

The experiments were performed on rats. Infantile rats, 3-4 weeks old, weighing 25 g., received subcutaneous injections of follicular hormone twice a week. These injections consisted of either α -hormone in aqueous or oily solution, or the benzoic ester of the dihydrofollicular hormone (Dimenformon).* The control animals received injections of normal saline or olive oil. In doses of 100 M.U. (mouse units) twice a week folliculin had no effect on body growth. After four months' treatment, with a total amount of 2900 M.U., the treated animals were of the same size and weight as the controls. On the other hand, when 1000 M.U. was applied twice a week, definite inhibition of growth was seen in 4½ weeks (after a total of 9000 M.U.). The larger the amount of hormone, the greater the inhibition of growth. The effect is very obvious if 5000 or 10,000 M.U. dimenformon is applied twice a week. A slackening of growth is apparent within a short time, though it only becomes really definite when the animals have reached the juvenile stage and weigh 70 g. While the weight curve steadily rises in the control animals, the curve of those which have been treated remains constant or rises very little. After 3-4 months' treatment—e.g., after the application of 100,000-200,000 M.U.—a difference in weight amounting to as much as 43 per cent. may be shown. For instance, the control animals weigh 164 g., and the treated animals 96.5 g.

If the experiments are performed on juvenile animals with a weight of 70 g., their growth may

* I am indebted to the Organon (Oss) for kindly supplying large amounts of Folliculin Menformon and Dimenformon.

similarly be inhibited. The application of 5000 M.U. folliculin twice a week produces inhibition after three weeks (total 30,000 M.U.), and if continued for 3-4 months (120,000-160,000 M.U.) leads to a difference in weight amounting to 20 per cent. The earlier the experiments are begun—i.e., the younger the animals—the more striking is the inhibition of growth. It is seen equally in male and female animals.

The relation between growth inhibition and the dose of hormone is shown in the accompanying Table. The inhibition affects the skeleton as well as the organs. The treated animals are shorter, and

Table showing Growth Inhibition resulting from Follicular Hormone

(A) INFANTILE ANIMALS

Sex.	Preparation.	Dose.	Duration of treatment in weeks.	Total amount Foll.-Menf. in m.u.	Growth inhibition shown by reduction of weight, per cent.
F.	Foll.-Menf. aqu. sol. (a-hormone).	100 m.u. twice a week.	16	2900	0
M.	Foll.-Menf. aqu. sol.	1000 m.u. twice a week.	5½	12,000	9.6
F.	"	500 m.u. twice a week.	12½	13,500	11.1
M.	Dimenformon.	5000 m.u. twice a week.	5½	60,000	32.7
M.	"	10,000 m.u. twice a week.	5½	120,000	31.7
F.	"	5000 m.u. twice a week.	15	130,000	30
F.	"	Initial injection of 15,000 m.u., then 5000 m.u. twice a week.	12½	145,000	23
M.	"		12½	145,000	43.3
F.	"	Initial injection of 15,000 m.u., then 10,000 m.u. twice a week.	12½*	225,000	30.7
F.	"		12½	275,000	39
(B) JUVENILE ANIMALS					
F.	Foll.-Menf. oily sol.	5000 m.u. twice a week.	15½	155,000	26.3
F.	Foll.-Menf. aqu. sol.	"	17½	190,000	23.5

* No treatment from 8/8 to 21/8. Foll.-Menf. = Folliculin-Menformon. aqu. sol. = aqueous solution. oily sol. = oily solution.

amounts of follicular hormone. The younger the animal, the more intense the inhibition. The retardation is particularly conspicuous during the puberty of the rats—i.e., at a weight of about 70 g. H. M. Evans and Long were able to demonstrate that the growth of rats can be increased by injection of anterior pituitary extracts. My experiments show, conversely, that large doses of follicular hormone may destroy the effect of the growth hormone of the anterior pituitary. Evans and Long produced giant animals by means of growth hormone, while I produce dwarf animals by means of follicular hormone. The fact that the inhibition of growth results from the paralysis of the growth hormone caused by the follicular hormone becomes evident when we find that the gonadotropic hormones which are produced in the anterior lobe may equally be inhibited.

INHIBITION OF THE GONADOTROPIC HORMONES

The sexual organs of the animals whose growth has been inhibited by follicular hormone show definite changes. Prolonged application of the hormone induces a continuous oestrus, with the result that vaginal smears regularly show cornified cells. The vagina is thickened and hyperplastic, and the mucous membrane proliferates. The uterus also shows much enlargement, and the myometrium is in the stage of pronounced proliferation. These enlarged genital organs contrast remarkably with pale and small ovaries, which may undergo so great an involution that they are no longer recognisable as such. While abundant corpora lutea are to be found in the control animals, they are absent in the ovaries of the treated animals. In serial sections small follicles are usually to be found, also some follicles of average size, but rarely large follicles, and never corpora lutea. This difference clearly manifests itself in reduction in the weight of the ovaries. When the application of follicular hormone was started in the juvenile stage (the animals weighing 70 g.), administration of 165,000 M.U. during 16 weeks caused a reduction of, e.g., 20 per cent. in body-weight and 58 per cent. in the weight of the ovaries. The ovaries of the control animals weighed 37 mg., those of the treated animals 15 mg.

The development of the ovaries is retarded by the prolonged application of follicular hormone; the follicles do not rupture, and corpora lutea are not formed. This effect undoubtedly originates in the following fashion: follicular hormone paralyses the gonadotropic hormones of the anterior pituitary—and, as it appears, the luteinising hormone, prolactin B, in particular—thus hindering them from exerting their normal influence on the ovaries.

The same reaction is to be observed in the male. It has long been known that folliculin has an anti-masculine effect, and that the testes diminish in size when it is administered. The way in which this happens has not hitherto been explained, but my experiments demonstrate that it is due to inhibition of those hormones of the anterior pituitary which stimulate testicular development. In the experiments previously described by other workers and by myself, relatively small doses of folliculin were used; but I am now able to show that if male rats are given doses sufficient to arrest their body growth tremendous changes in the testes are produced. This may be illustrated by the following example.

Male rat, 4 weeks old, and weighing 30 g., received one injection of 15,000 M.U. dimenformon, followed by regular application of 5000 M.U. twice a week. After three months' treatment, with the total dose of 155,000 M.U., the animal

the bones are more delicate. As an example I report the differences in weight of one of the experiments.

Control animal.—The femur weighs 0.35 g., tibia and fibula 0.31 g.

Folliculin animal (R 117) (five months' treatment with a total of 205,000 M.U.)—The femur weighs 0.29 g., tibia and fibula 0.24 g.—i.e., a difference in weight of 17 and 22 per cent. respectively.

The anatomical changes in the epiphyseal lines will be reported in a separate communication.

Mention may further be made of changes in the fur of animals under treatment. The hair is rough and shaggy, and shows a tendency to fall out, particularly in the gluteal region.

The experiments demonstrate the possibility of inhibiting growth by prolonged application of large

weighs 94 g., while the control animal weighs 160 g.† —a difference of 41 per cent. In the control animal the weight of the mature testis was 1000 mg., but in the treated animal only 50 mg.—a difference of 95 per cent. The testes of the treated animal remained at the infantile stage seen in animals two weeks old.

The development of the genital apparatus (testis, spermatogenesis, prostate, and seminal vesicles) is completely arrested by prolonged application of folliculin.

In a further report I hope to describe the effects of large doses of folliculin on the thyrotropic hormone and other hormonotropic active principles, as well as the changes in the anterior lobe of the hypophysis of the treated animals. The importance of these results in clinical work will be discussed later.

INTRAVENOUS CURARINE IN THE TREATMENT OF TETANUS

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CURARINE is the commonest active principle of curare. It is responsible for the characteristic action of the curares of British Guiana and its presence in these is constantly due to the bark of a ligneous vine, *Strychnos toxifera*, which is a chief ingredient of the native mixture.

Curarine is a quaternary alkaloid which can be prepared in crystalline form either from suitable curare or direct from *S. toxifera*. It is the latter source which has enabled the alkaloid to be prepared in quantity recently (King, 1935).

The action of curarine is the classical one of curare—a paralysis of muscle from a failure of the effective transmission of the impulses travelling to it along the motor nerve. Death from curarine is due to asphyxia following failure of the respiratory muscles. But the paralyzing action of curarine is not necessarily sudden, complete, and universal; it is graded quantitatively and has a selective anatomical distribution. Experimentally, in animals, small doses cause a failure of *maintenance* of contraction (response to electrical tetanus) while the response to single stimuli remains good. Recently curarine has been found to act selectively on certain rates and strengths of electrical stimuli (Briscoe, 1935). Further, the pathological conditions of decerebrate rigidity in the cat and of experimental local tetanus have been found by Bremer (1927) to respond selectively to curare, and, in the case of decerebrate rigidity, to curarine (1935). Anatomically, the order of sensitivity of muscles is strikingly constant, viz.: (1) muscles receiving a cranial nerve-supply; (2) the skeletal muscles generally, including the intercostal muscles; and (3) the diaphragm.

Curare has been introduced into therapeutics and abandoned on many occasions since the middle of last century. The irregular strengths and compositions of curares would make their standardisation very difficult. Curarine was isolated from curare by Preyer (1864) and tried therapeutically by Hoffmann (1879). It was prepared from *S. toxifera* by Boehm and given to a case of tetanus by Hoche (1894), (Hale-White, 1901). Recent partial successes

† The control animals received olive oil subcutaneously twice a week in the same amounts as were used for the oily solution of dimenformin in the treated animals.

in treating chronic pathological rigidities with some crude curares (Hartridge and West, 1931; West, 1932) has led to a collection of plant material and a resurvey of the pharmacology of curarine (West, 1935). Meanwhile Cole (1934) and Mitchell (1935) have reported cases of acute tetanus treated with curare and with curarine respectively. Florey, Harding, and Fildes (1934) gave curarine to animals in experimental tetanus.

In our animal experimentation it was noticed that, in the cat, a clear removal of decerebrate rigidity without failure of respiration could be maintained only by giving the drug very slowly. The intravenous route was found much safer than the subcutaneous in that by its partial recovery will occur within a few minutes of stopping the inflow of the drug. A tendency to bronchial spasm and hypersecretion was met by atropine or adrenaline, for rapid action the latter being preferable. This intravenous technique was transferred to man and tried in a volunteer suffering from advanced parkinsonism. The method finally adopted, and here described, forms a provisional suggestion for the treatment of severe cases of tetanus.

Method of Treatment

The apparatus used is the following:—

1. An intravenous drip outfit, with duplication of reservoir and dripper. The dripper must be calibrated. The Canny-Ryall or Farquharson dripper commonly delivers from 500 to 700 drops per ounce of fluid. The vein may be entered either by needle or cannula.
2. A malleable gutter splint to fix the arm in a comfortable position.
3. Artificial respiration equipment: endotracheal catheter—e.g., St. Bartholomew's type (grey), small, medium, or large. Two oxygen cylinders, with good fine adjustments on the taps; glass junctions for tubing.
4. Direct-vision laryngoscope.
5. Mason's gag, tongue forceps, mounted swabs (as anaesthetist's tray).
6. Adrenaline solution 1:1000.
7. Curarine chloride in solution, 100 mg. of the solid to a pint of saline or glucose saline.

Dose.—The standard rate of curarine inflow may be taken as 0.25 mg. per kg. of body-weight per hour. The rate of drip required to deliver this may be calculated as follows:—

$$\text{Drops per minute} = \frac{0.25 \times \text{wt. of patient (kg.)} \times \text{drops per oz. from dripper} \times 20}{\text{mg. curarine per pint saline} \times 60}$$

If the curarine is made up at a strength of 100 mg. to the pint, the patient's weight is 70 kg., and the dripper is found to deliver 600 mg. per oz., this becomes—

$$\text{Drops per minute} = \frac{0.25 \times 70 \times 600 \times 20}{100 \times 60} = 35$$

A pint of solution lasts about six hours.

Technique.—An initial dose of atropine (gr. 1/50) is given subcutaneously, and ten minutes later an intravenous needle is strapped in position in a suitable vein on an arm which is splinted so as to flex the elbow at some 30°. (The fully extended arm was found a very painful posture.) A can of warmed glucose saline with a visible drip attachment is connected, and curarine added to the solution so as to deliver 0.25 mg. per kg. per hour to the patient. It is convenient if it is arranged so that this is equivalent to about 30 drops per minute in the dripper. A second can of warmed normal glucose saline connected to the intravenous system near the patient's arm is a valuable means of securing fluid and food to the patient and of preventing clotting in the

needle or vein whenever the curarine-saline has to be turned off.

At first the curarine-saline is run in at six times its "maintenance rate"—e.g., 3 drops per second—so that 0.25 mg. per kg. is delivered in about ten minutes. This should be sufficient for curarisation, and during the administration the patient is closely watched, and, if well enough, interrogated about his sensations.

Curarisation.—A muscular weakness in the distribution of the cranial nerves is to be expected as the sign of partial curarisation. The patient may complain that his head is heavy, that his tongue will not move, or of diplopia. Ptosis is usually the first objective sign of curarisation, but weakness of other motor cranial nerves may be noted early. At the first sign of curarisation it is wise to halve the rate of inflow. But, speaking from my present limited experience, I would designate as the best sign of effective curarisation a change in the breathing. A nurse will record the breathing as "shallow." Actually intercostal respiration almost or quite ceases, abdominal (diaphragmatic) respiration continuing steadily and without effort. The change is often sudden and indicates that curarisation has gone as far as it can be taken unless respiratory failure is to be courted deliberately.

On completion of the induction of curarisation, the inflow is stopped for about five minutes and then restarted at the maintenance level of 0.25 mg. per kg. per hour. For the first hour its effects should be watched closely, as the rate may be too high and lead to an actual shallowness or a visible effort in abdominal breathing, or too low, with resultant return of intercostal breathing or an increase of the pathological rigidity.

In a case of tetanus with persistent tonic rigidity of jaw, neck, and abdomen, there should be marked, if not complete, relaxation of these muscles when curarisation has occurred to the level indicated. With an ordinary sized dripper (e.g., the Canny-Ryall) a pint of curarine-saline, dripping at a rate of 30 drops per minute, may be expected to last about six and a half hours. Animal experiments suggest that atropine (gr. 1/100 to 1/50) should be given subcutaneously every four hours, if bronchial spasm and hypersecretion are to be avoided. Should they occur, adrenaline is probably a better immediate remedy.

It is not yet possible to say how long treatment by curarine drip can be maintained in tetanus. In Case 2 (below) it was continued for 20 hours without difficulty, other than from (avoidable) clotting in the needle.

Sleep remains an important desideratum. I think a small nightly dose of morphine may be given safely, and the treatment is not incompatible with *light* Avertin anaesthesia (0.05 c.cm. per kg.). The patient to whom this was given slept well and yet lightly for three hours. Weakness of the muscles of deglutition may cause difficulties and accidents in swallowing, and if these occur a feeding-tube should be passed early and kept in position as long as is necessary.

If dangerous spasms occur they are likely to be respiratory in type, and particularly bronchial. These may be due to the tetanus. But pure curarine is itself capable of causing bronchial and laryngeal spasm in animals, and the history of one patient (Case 13) shows this to be a real danger of curarine in man. So sudden may the onset of the spasm be, that, even when it is watched for and the requisite apparatus is immediately to hand, it may be difficult

to deal with. An intermittent closure of the glottis occurs, and an endotracheal catheter has to be passed during the first possible moment of relaxation if the patient's airway is to be secured. I have used the St. Bartholomew's type (grey) intratracheal catheter in one emergency of this kind, and found it satisfactory. A rapid stream of oxygen should be delivered through the catheter. Consciousness is lost very early; the catheter should be retained until there are signs of its return, and only removed then if spontaneous breathing is active.

In critical cases of tetanus adequate relaxation may be incompatible with the retention of spontaneous respiration. Curarisation may then be deliberately deepened, and a means of artificial respiration provided. The Bragg-Paul Pulsator (Messrs. Siebe Gorman and Co.) can be used. But in view of the risk of bronchial spasm it is essential to be able, in addition, to deliver oxygen directly to the lungs by the endotracheal catheter. For, in animals under severe curarine spasm, it is impossible to perform effective artificial respiration by a compression method.

Ten Cases of Tetanus

The accompanying Table summarises 10 cases of tetanus treated during 1935. They illustrate the observation that when the incubation period is under seven days or the period of development of symptoms to the point of generalised convulsions less than three days, death must be expected whatever the treatment adopted. Cases 1, 2, 3, 4, 8, 9, and 10 fall into this category, and though their treatments were various, all the patients died. Of these 7 cases it will be noted that, in 5, death occurred not later than the day after the onset of general convulsions. The exceptions are Cases 2 and 10. The former was given intravenous curarine, the latter avertin in repeated doses. Case 10 was exceptional in the very long incubation period of 19 days being followed a day later by generalised convulsions. On the twenty-second day of his illness the patient, a man of 63, appeared to be improving. Acute hyperpyrexia occurred, with cardiac failure, on the twenty-third day. The case treated with curarine (No. 2) is described below.

Of the three cases in which the outcome was reasonably in doubt (Nos. 5, 6, 7) two had an incubation period of seven days, and one of these recovered. Cole (1934) recorded the treatment of such a patient with curare and his subsequent recovery. This patient (No. 5) was a boy of 13. He received no curare and no special treatment beyond repeated anti-tetanic serum and a chloral and bromide mixture.

CASES TREATED WITH CURARINE

CASE 2 was extremely severe. The incubation period was five days and the generalised convulsions occurred on the following day. On admission, 60,000 units of antitetanic serum had been given. Paraldehyde grs. 60 and bromide grs. 40 had been given repeatedly. I saw the patient early on the seventh day. There was a high degree of tonic spasm of the jaw, neck, and abdominal muscles.

Treatment.—After atropine gr. 1/50, curarine 12 mg. was given intravenously, taking seven minutes over the injection. Complete ocular ptosis resulted, with partial relaxation of the muscles of the jaw, neck, and abdomen. Curarine is rapidly excreted, and much of the rigidity returned within 30 minutes. When full rigidity had returned, 10 mg. of curarine in 10 c.cm. of solution was injected intravenously during four minutes. Full relaxation of the trismus occurred, the patient supporting his fallen jaw in his hand. Relaxation of the neck and abdominal muscles followed. Fifteen minutes later, and

Table of Cases of Tetanus, 1935

Case and age.	Incubation and development.		Treatment.		Outcome.
	Probable site of infection.	(a) Onset. (b) Convulsions. Day.	Serum and period. Units.	General and special.	
1 (9)	Splinter in foot.	(a) 5th (b) 6th	490,000	Sedatives.	Fatal spasm on 2nd day of symptoms, 7th day.
2 (27)	Nail in foot.	(a) 5th (b) 6th	200,000 3 days.	Curarine intravenously 20 hours. Avertin 0.05 c.cm. per kg. once.	8th day. Resp. spasm and asphyxia.
3 (c. 50)	?	(a) 5th (b) 7th	120,000 2 days.	Avertin 0.05 c.cm. per kg. 2-hourly.	8th day convulsions ceased: hypostatic pneumonia.
4 (9)	Splinter in leg.	(a) (b) 7th	—	—	Death under light chloroform ether anaesthesia, for diagnostic lumbar puncture.
5 (13)	—	(a) 7th (b) 10th	24,000 2 days, 365,000 8 days.	Chloral grs. 10, bromide grs. 15, 4-hourly.	3 convulsions on 10th day. 11th day improving. 34th day recovered.
6 (32)	Nail in foot.	(a) 7th (b) 11th	192,000 2 days.	Curarine intravenously.	12th day. Resp. spasm, cardiac failure.
7 (24)	Cut hand.	(a) 10th (b) 14th	150,000	Curarine subcutaneously.	15th day. Fatal resp. spasm following feeding.
8 (51)	Infected finger.	(a) 11th (b) 12th	200,000 at once.	Avertin 0.1 c.cm. per kg. 6-hourly (reduced).	13th day. Generalised fatal spasm.
9 (38)	Nail in foot.	(a) 13th (b) 15th	120,000 2 days.	Chloral and bromides.	16th day. Fatal spasm (the second).
10 (63)	Compound fracture tibia.	(a) 19th (b) 20th	200,000 3 days.	Avertin 0.05 c.cm. per kg. 4-hourly.	23rd day. Hyperpyrexia and sudden cardiac failure.

during full relaxation, 10 mg. curarine was given subcutaneously. Curarine takes 20–30 minutes to be absorbed from the subcutaneous tissues. Good relaxation was obtained for 2 hours. After 4½ hours full tonic rigidity had returned and small added spasms had commenced at 5-minute intervals. After atropine gr. 1.50, curarine 9 mg. in 9 c.cm. in 4½ minutes was given intravenously. Rigidity was removed but began to return in 35 minutes. Thereupon the curarine intravenous drip was started.

Induction of relaxation was obtained by giving 7.5 mg. in 7 minutes. A lower rate of inflow was then adopted, and 66 mg. was given in each 6-hourly period for 18 hours. During this period the patient remained almost flaccid, slept and was fed. He received two injections of morphine gr. ½, and during the treatment sleep was assisted by one-half dose (0.05 c.cm. per kg.) of avertin rectally. After 18 hours of treatment, difficulty from clotting in the needle caused the return of rigidity, a rapid deterioration in the patient's condition, and the onset of attacks of respiratory spasm. Curarine was restarted as a continuous subcutaneous injection, but it was found impossible to maintain a constant rate of inflow. Further respiratory spasms were difficult to control owing to the difficulty of introducing endotracheal catheters. The patient's own respiration was probably weakened by the curarine, and the strain of right-sided cardiac congestion and anoxæmia caused a comparatively sudden cardiac failure.

The outcome of this case was a disappointment. For it was felt that a patient who had been success-

fully treated for two days after the onset of violent tetanic spasms might have survived if further time could have been given for the progressive removal of his toxæmia.

CASE 6.—The onset of symptoms was on the seventh day, and although generalised spasms did not occur until the eleventh, the case then became critical. A generalised convulsion had occurred during the early morning. During the day the patient was free of spasms, but in the evening they returned and by midnight they were prolonged and severe. The technique described was followed and an intravenous drip established at a rate of 0.27 mg. per kg. per hour. Considerable relaxation was obtained and the patient continued to breathe spontaneously without difficulty. After 3 hours of curarisation spasms involving the bronchial muscles occurred. Four such spasms occurred within an hour and necessitated the passage of the endotracheal catheter. The patient was considerably cyanosed before the catheter could be introduced, and his general condition had deteriorated. After the institution of endotracheal oxygenation there was no further cyanosis, but larger concentrations of curarine (0.4 mg. per kg. per hour) had to be given to maintain flaccidity. Six hours after the commencement of curarisation, and 2 hours after the passage of the catheter, the pulse-rate had risen and there were already signs of pulmonary congestion. The jaw remained relaxed, the neck muscles largely relaxed, the abdominal muscles partly so. The limbs were flaccid, the patellar reflexes which are abolished only in deep curarisation were generally but not always obtainable. It was decided not to stop the curarine inflow, in view of the inevitable return of muscular spasm. But from the time of the last respiratory spasm the patient's condition became worse until death from cardiac failure 2½ hours later.

CASE 7.—In this case the incubation period was ten days, and a further four days elapsed before the onset of generalised spasm. The patient was first seen after these had become very severe. Rapid respiration, tachycardia, and high fever were present. Each spasm arrested respiration for about a minute, and each was expected to end fatally. Curarine 2.5 mg. was given subcutaneously when the case was seen. An hour later the patient was fed through a tube and immediately suffered a long respiratory spasm. Curarine 7.5 mg. was then given subcutaneously and oxygen continuously by a short nasal tube. Relaxation occurred 30 minutes subsequently, but the patient never recovered consciousness after the previous respiratory spasm and died an hour later.

Death from generalised spasm involving respiration is one of the common ends in cases of tetanus. But in animals curarine had itself shown a tendency to cause respiratory spasms (West, 1935). In decerebrate cats these spasms can be prevented by atropine and removed by adrenaline. The means of their production is not clear, for though an isolated strip of the tracheal muscle of the cat will contract under the influence of curarine, it does so uncertainly and only with the drug in high concentration (1:1700). Such contractions of the isolated tracheal muscle are relaxed by adrenaline (1:125,000), but not by atropine.

Control Observations

In order to ascertain the therapeutic effect of curarine on the rigidity of post-encephalitic parkinsonism, three advanced cases were treated with the drug by the intravenous route.

CASE 11.—After the effects of ascending doses had been tried, the first patient received 0.25 mg. per kg. in 10 c.cm. of solution during 11 minutes by intravenous injection. Blurred vision and slight headache occurred, but there was no loss of rigidity or of tremor, both of which were marked features of the case. The result confirmed previous observations with curarine given subcutaneously (West, 1935). No respiratory symptoms developed.

CASE 12.—The second patient received intravenous curarine by the drip method; an induction with 0.1 mg. per kg. in 5 minutes (1.2 mg. per kg. per hour) resulting in a temporary reduction of rigidity. The rate of inflow was halved after 5 minutes and continued at about 0.6 mg. per kg. per hour for 10 minutes. Severe ptosis developed, the pathological rigidity relaxed, probably with some loss of power, and respiration became purely abdominal. The curarine inflow was then stopped, but restarted 10 minutes later. Rigidity returned very quickly after cessation of the curarine inflow. No laryngeal spasm occurred. The case shows that, even with the best conditions—a dripping inflow giving a gradual and controlled rise of concentration in the blood stream—the power of removing rigidity is transitory and the margin between the effective and the asphyxial concentrations small.

CASE 13.—The third patient was very rigid, with a good deal of added tremor. A preliminary injection of atropine gr. 1/50 was given; the patient having already considerable tolerance to drugs of this series. Curarine induction occupied 20 minutes and was continued until the arms were relaxed, the tremor being somewhat diminished. The flow was then interrupted for 5 minutes, after which stiffness was again increasing. Curarisation was continued at about 0.8 mg. per hour until ptosis developed (3 minutes), the patient felt unable to raise the arm (5 minutes), and breathing became "light"—i.e., abdominal (10 minutes). Parkinsonian rigidity was virtually abolished, and tremor remained nowhere but in the lips. This level of curarisation was maintained for 15 minutes at a rate of 0.2 mg. per kg. per hour, when the inflow was stopped. An hour later the patient had had a meal and the rigidity had largely returned. Curarisation was now induced more rapidly, at over 3 mg. per kg. per hour. Relaxation and "light" breathing occurred after 8 minutes and the inflow was stopped. Immediately subsequently the patient pointed to her throat, choked, and was apparently unable to breathe further. The condition closely resembled what has been described in animals under curarine (*loc. cit.*). An electric laryngoscope was instantly inserted into the mouth, and the endotracheal catheter passed, with some difficulty, owing to a spasm of the false vocal cords. A stream of oxygen was blown through the catheter, which was not removed for nearly half an hour, when its presence appeared to embarrass the patient. After the catheter had been passed, adrenaline and later strychnine were given hypodermically. The patient was able to talk 50 minutes after the onset of the spasm. She recollected no events between its commencement and the manipulation of an airway after the removal of the oxygen catheter. Sore-throat and some bronchial catarrh developed on the following day, but the patient was able to get up on the third day. She declared her rigidity to be less than previously, but if this were so it did not remain so.

The alarming experience of this "control" case demonstrates the reality of the danger of curarine respiratory spasm.

Conclusions

(1) Curarine treatment of tetanus should still be reserved for cases which are already very severe or in which by the accepted criteria (Cole, 1935) the prognosis is very grave. I have not yet had experience of a case of tetanus which showed its first symptom less than seven days after infection, and which subsequently recovered. Cole (1935) records one such case, with recovery under antitoxin and general treatment only. But cases occurring on the seventh day have recovered with and without curare.

(2) If curarine be given in severe tetanus, the intravenous drip is probably the most effective method of its administration.

(3) A real danger of curarine treatment—bronchial spasm—is shown by the experience with a "control" case of advanced parkinsonism (Case 13). The

spasm can be effectively treated by prompt endotracheal intubation only. Probably the risk of it is increased if the induction of curarisation is hastened beyond the rate of 1.5 mg. per kg. per hour (or 0.25 mg. per kg. in ten minutes). Animal experiments justify the administration of atropine gr. 1/100–1/50 hypodermically before and at four-hour intervals during the period of curarisation, and of a full dose of adrenaline (1 c.cm. liquor adrenalini hydrochlor.)* if the spasm occurs.

(4) Curarine in its present available form is unsuitable for the treatment of cases of chronic rigidity.

(5) Curarine is given to cases of tetanus only as a means of removing muscular spasm. It may be combined with other methods of treatment, particularly with *light* avertin narcosis. Needless to say antitoxin is required as urgently as with any other treatment. At present I would give 200,000 units when the diagnosis is made. This is the recommendation of Cole in his recent full review of the treatment of tetanus (1935). In the early and acute cases, if the patient can be kept alive for two days, the giving of more serum should be considered. I should like to endorse Cole's plea for early diagnosis: "Stiffness of the jaw, especially if accompanied by pain in the back or abdomen, probably means tetanus."

Summary

(1) The administration of curarine by continuous intravenous drip is described.

(2) Ten cases of tetanus are recorded, nine of which proved fatal. Treatment varied (see Table).

(3) In two fatal cases curarine was given intravenously, and in one of them death was delayed beyond the expected point. Respiratory spasm followed an inability to maintain an even curarisation after 18 hours of successful treatment.

(4) The treatment of three cases of advanced parkinsonism by the administration of curarine intravenously is recorded. The absence of an adequate margin between the rigidity-removing ("lissive") dose and that affecting respiration, together with the transitory action of curarine, renders it, in its present available form, unsuitable for the treatment of these chronic conditions.

(5) Experience with one case of parkinsonism under curarine treatment establishes bronchial spasm as a serious danger of curarine therapy in man.

(6) It is suggested that the best method of giving curarine which is at present available is by intravenous drip. This method can be controlled from minute to minute, if necessary, and enables the narrow margin between the beneficial "lissive" action and the asphyxial action on respiration to be increased. It is further suggested that the only present place for intravenous curarine in therapeutics is its continued experimental use in cases of tetanus in which, by the accepted standards (Cole, 1935), recovery cannot be expected by other means.

I am indebted to the following for permitting me to see cases of tetanus under their charge: Mr. P. H. Mitchiner, Dr. R. Harvey-Williams, Dr. W. M. Robson, Dr. Maurice Shaw, Dr. Leslie Cole, Dr. R. Grainger, and the medical superintendents of Kingston Municipal Hospital, Croydon Municipal Hospital, and West Park Mental Hospital, Epsom. I received both help with cases and suggestions for improving technique from: Dr. Maurice

* Recent animal experiments showing a spasmodic action of curarine on isolated tracheal and bronchial muscle to be immediately antagonised by adrenaline suggest that this drug should be given very slowly by the *intravenous* route until relaxation occurs.

Shaw (who suggested the intravenous route), Mr. J. Lindahl Dr. R. Woolmer, and A. Kennedy.

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A MERCURIAL (NOVURIT) SUPPOSITORY AS A DIURETIC FOR CARDIAC OEDEMA

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ORIGINALLY introduced by Zieler¹⁴ as a remedy for syphilis in 1917, Novasurol was first used as a mercurial diuretic for dropsy by Saxl and Heilig¹³ in 1920. Satisfactory as a diuretic, it proved to have the disadvantage in some patients of causing a severe diarrhoea and other toxic effects. By means of chemical modifications, Salyrgan was synthesised in 1923, and it is now clear that as a diuretic it is as potent as novasurol, and that its toxicity is negligible. A similar though not identical product known as Neptal was subsequently produced in France, and it also proved efficacious in the treatment of dropsy.

These preparations have the disadvantage of having to be administered intravenously or intramuscularly, preferably by the former route. Sloughing may result from leakage into the subcutaneous tissues, and the patient have to submit to an exceedingly painful arm for the subsequent 24-48 hours. This should seldom occur, and it can be obviated with fair certainty and with little additional trouble by diluting the contents of the phial to 10 c.cm. with sterile water or saline as recommended by Bedford.¹ Attempts have been made to administer salyrgan by mouth, but with little success. Thus Fleckseder⁶ gave it in daily doses with ammonium chloride over a period of several weeks with a meagre result. Engel and Epstein⁵ refer to rectal administration of salyrgan in 100 c.cm. water, with moderately good results.

Herrmann and his colleagues⁷ suggested that a combination of the organic mercurial diuretics and the purine bases produced a larger diuresis than either separately. Such a combination is found in a preparation with the trade name of Novurit which has been tested and found satisfactory by many workers including Popper,¹¹ Crawford and McDaniel,³ and DeGraff, Nadler, and Batterman.⁴ Novurit is a sodium salt of trimethylcyclopentandicarboxylic acid allylamidmethoxymercurichydroxide combined with theophyllin. It may be given intravenously or intramuscularly in doses of 1-2 c.cm., each c.cm. containing 0.10 g. of the mercurial salt and 0.05 g. of theophyllin.

Recently the same drug has been prepared in the form of a suppository which contains 0.5 g. of novurit in cocoa butter. Though rectal administration of a drug often has clear disadvantages compared with oral administration, an effective suppository would be a simpler method in private practice than an intravenous injection. It would be an advance in the therapeutics of congestive heart failure to be able to administer a mercurial diuretic simply and safely by this route. This paper records our short experience of the clinical action of novurit suppositories. We have been assisted throughout by Dr. Basil S. Grant to whom we are indebted.

METHODS

The problem of controls in a clinical investigation is always difficult. To take alternate patients and give to one the suppository, and to the next an intravenous mercurial diuretic the action of which is already known, has the disadvantage that no two cases of cardiac dropsy are alike. The alternative, and the method used by us, is to administer different drugs to the same patient. Of course, one disadvantage of this method is that the drug first administered is more likely to produce a diuresis than one given later when the oedema is already diminishing; but on the whole we feel that it is the better method.

Twelve consecutive cases have been so treated, all being cases of congestive heart failure with oedema, although in some the oedema was slight. Two of them are excluded from this report: one died with hemiplegia and coma a few days after admission for heart failure; the other was excluded because he had received regular doses of digitalis, and we wished to test only those free from all medication other than the diuretics under discussion. Brief summaries of the ten consecutive cases utilised for this study are as follows:—

CASE 1.—Female, aged 23. Mitral stenosis. Aortic incompetence. Normal rhythm. Failure. Two years, dyspnoea. Eight weeks, palpitation and swelling of abdomen. Three days, swelling of ankles.

On admission: Cyanosis, dyspnoea, oedema of feet and lumbar region, ascites, enlarged liver, right hydrothorax. Pulse-rate 100. Electrocardiogram, sinus tachycardia. Urine, trace of albumin. Weight 7 st. 3½ lb. (46.1 kg.).

On discharge: No evidence of oedema or hydrothorax, liver not palpable. Weight 5 st. 8½ lb. (35.7 kg.).

CASE 2.—Male, aged 60. Angina pectoris. Normal rhythm. Failure. Eight years, angina of effort. Two months, dyspnoea. Two weeks, swelling of ankles.

On admission: Dyspnoea, liver slightly enlarged. Pulse-rate 100. Blood pressure 120/95. Radioscopy, small right hydrothorax. Urine, trace of albumin.

On discharge: No evidence of oedema or hydrothorax, liver not palpable.

CASE 3.—Male, aged 59. Auricular fibrillation. Failure. One year, increasing dyspnoea, palpitation. Two weeks, swelling of ankles. Three days, jaundice.

On admission: Orthopnoea, cyanosis, jaundice. Marked oedema of ankles and lumbar region. Pulse-rate 104. Electrocardiogram, auricular fibrillation. Radioscopy, no hydrothorax. Urine, trace of albumin. Weight 9 st. 5½ lb. (59.8 kg.).

On discharge: No evidence of oedema. Weight 8 st. 4½ lb. (53.0 kg.).

CASE 4.—Female, aged 66. Hypertension. Auricular fibrillation. Failure. Several years, increasing dyspnoea. Two weeks, persistent dyspnoea and oedema of feet.

On admission: Orthopnoea, cyanosis, oedema of feet, legs, and lumbar region. Liver enlarged. Pulse-rate 90. Electrocardiogram, auricular fibrillation. Radioscopy, right hydrothorax. Urine, trace of albumin. Weight 11 st. 10½ lb. (74.8 kg.).

Response to diuretics was slow. Died in hospital three

weeks after admission. Weight (4 days before death) 10 st. 4 lb. (65.5 kg.).

CASE 5.—Male, aged 68. Hypertension. Normal rhythm. Bronchitis and emphysema. Failure. One year, dyspnoea and oedema. Six months ago, in-patient with heart failure.

On admission: Orthopnoea, gross anasarca, ascites, bilateral hydrothorax. Pulse-rate 104. Electrocardiogram, normal rhythm. Blood pressure 170/110. Urine, cloud of albumin.

On discharge: No evidence of oedema or enlargement of liver. Loss of weight, 3 st. 8 lb. (22.7 kg.) (see Chart).

CASE 6.—Male, aged 25. Mitral stenosis. Aortic incompetence. Auricular fibrillation. Failure. In-patient on three occasions during preceding year on account of failure. Three weeks, swelling of abdomen. One week, increasing dyspnoea.

On admission: Afebrile, dyspnoea, anasarca, ascites, liver enlarged. Pulse-rate 90. Electrocardiogram, auricular fibrillation. Blood pressure 140/90 approximately. Radioscopy, no hydrothorax. Urine, trace of albumin. Weight 10 st. 10½ lb. (68.4 kg.).

On discharge: No oedema. Liver not palpable. Weight 8 st. 8½ lb. (54.8 kg.).

CASE 7.—Male, aged 58. Chronic bronchitis. Angina pectoris. Normal rhythm. Failure. Ten years, "winter cough." Two months, angina pectoris, palpitation, and dyspnoea.

On admission: No orthopnoea, slight oedema of ankles. Pulse-rate 96. Electrocardiogram, normal rhythm. Blood pressure 170/80. Radioscopy, small left hydrothorax. Urine, no albumin. Weight 12 st. 11 lb. (81.4 kg.).

On discharge: No oedema or hydrothorax. Weight 11 st. 4 lb. (71.8 kg.).

CASE 8.—Female, aged 53. Chronic bronchitis. Normal rhythm. Failure. Four years, dyspnoea and oedema of ankles. "Winter cough" for many years.

On admission: Dyspnoea, slight oedema of legs. Pulse-rate 76, normal rhythm. Blood pressure 162/70. Radioscopy, no hydrothorax. Urine, no albumin. Weight 10 st. 10½ lb. (68.4 kg.).

On discharge: No oedema. Weight 10 st. 5½ lb. (66 kg.).

CASE 9.—Male, aged 65. Aortic stenosis (arterio-sclerotic). Normal rhythm. Failure. One year, dyspnoea on exertion. Four months, nocturnal dyspnoea. Two months ago, in-patient with heart failure.

On admission: Orthopnoea, oedema of legs, moderate ascites, liver enlarged to umbilicus. Pulse-rate 80. Electrocardiogram, normal rhythm, low voltage all leads. Blood pressure 110/70. Radioscopy, no hydrothorax. Urine, trace of albumin. Weight 9 st. 6 lb. (60 kg.).

On discharge: No oedema. Liver not palpable. Weight 8 st. 2½ lb. (52 kg.).

CASE 10.—Male, aged 64. Chronic bronchitis and emphysema. Normal rhythm. Failure. Several years, "winter cough." One year ago in-patient with heart failure.

On admission: Orthopnoea. Slight oedema of ankles. Liver just palpable. Pulse-rate 78. Electrocardiogram, normal rhythm. Blood pressure 130/70. Radioscopy, no hydrothorax. Urine, no albumin. Weight 9 st. 5 lb. (60 kg.).

Progress: Oedema disappeared and liver no longer palpable, but very little relief of cough. Weight 8 st. 10 lb. (55.4 kg.).

The two drugs used as controls

were salyrgan and novurit, the former because its value has now been well established, the latter in order to compare the effect of the same drug intravenously and by rectum. Both were given intravenously and never intramuscularly, salyrgan in the dose recommended by the makers, i.e., 2 c.cm. which contains 0.2 g. of the salt, and novurit also in the dose recommended, i.e., 2 c.cm. which contains 0.2 g. of the mercurial salt and 0.1 g. of the theophyllin.

No other drugs were administered if it could be avoided, excepting ammonium chloride as an adjuvant as described below. In only two cases was digitalis given during the period of observation, though naturally it was often used later. In one of these (Case 3) only 45 minims (3 c.cm.) of the tincture were given on the day of admission, three days before observations were begun. The other patient (Case 4) had severe congestive failure and auricular fibrillation, and digitalis had to be administered in view of a rising ventricular rate and increasing symptoms. Observations on the mercurial diuretics were therefore made only before digitalis was given and again in combination with digitalis when the effect of the latter on the urinary output had become stabilised.

Ammonium chloride as an adjuvant in the treatment of oedema with organic mercurial preparations has been widely adopted during the last ten years following upon the work of Rowntree, Keith, and Barrier,¹² and Keith and Whelan.⁸ There is still no agreement as to the optimum dose, and in this investigation we have given it only for the 24 or

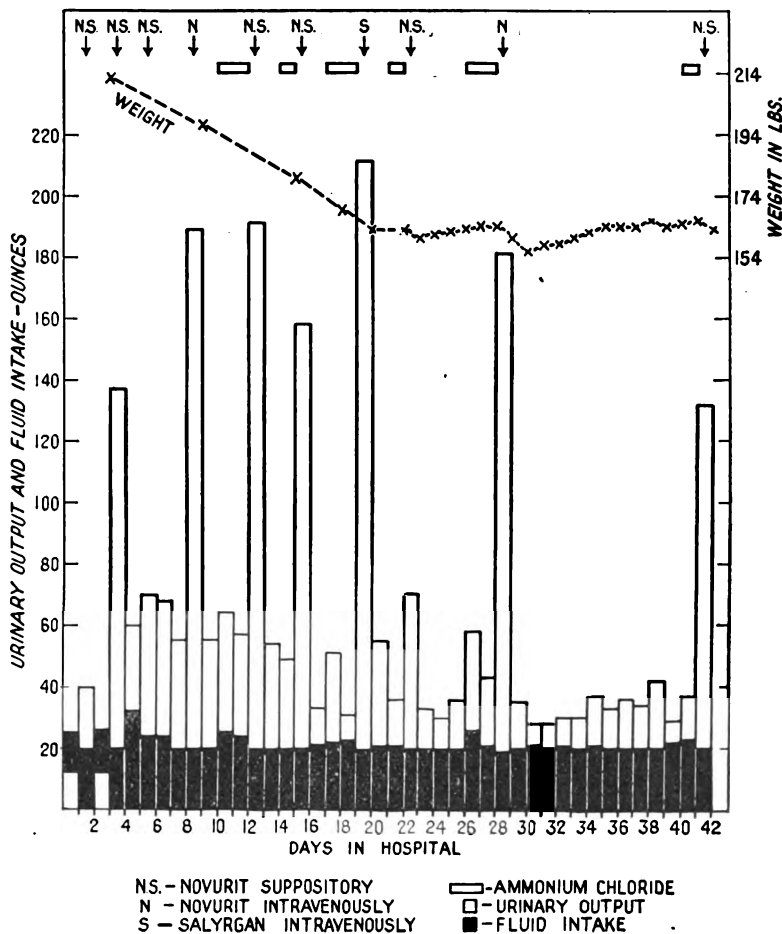


Chart showing comparative effects of various mercurial diuretics in an illustrative case. (Case V.)

48 hours preceding the exhibition of the mercurial preparation. In most cases it was given for 48 hours—grs. 120 (8 g.) during the first 24 hours and grs. 90 (6 g.) during the second. In the few cases where it was given for 24 hours only, the dose was grs. 120 (8 g.). There is difficulty in disguising its salty taste; in this series it was prescribed with liquid extract of liquorice, as recommended by the British Pharmaceutical Codex,² but the disguise is thin. The sucking of a lemon helped to remove the unpleasant taste from the mouth in some patients.

The *method of investigation* was as follows. The patient was kept in bed and a low-salt diet was ordered from the outset with a daily fluid intake restricted to 20–30 ounces (2000–2500 c.cm.). For the first three days, or until it was evident that the urinary output was steady, no treatment beyond rest was given. Thereafter the three preparations—novurit suppositories and novurit and salyrgan intravenously—were administered as follows.

SCHEMA

- (1) Novurit suppository preceded by enema a few hours before.
- (2) Novurit suppository. Aperient two nights before.
- (3) Novurit suppository preceded by enema a few hours before. Ammonium chloride administered during previous 48 or 24 hours.
- (4) Novurit suppository. Aperient two nights before. Ammonium chloride administered during previous 24 or 48 hours.
- (5) Novurit intravenously with or without previous administration of ammonium chloride as in (3) and (4).
- (6) Salyrgan intravenously with or without previous administration of ammonium chloride as in (3) and (4).

As a general rule one of these preparations was administered every third day.

RESULTS

In no case did we fail to obtain a diuresis with each of the drugs used. The accompanying Chart has been chosen as a typical example of the results achieved. The œdema began to diminish immediately and all clinical evidence of it had disappeared as a rule within a fortnight, the exact time varying with the initial degree of œdema. Thus in Case 6 there were no clinical signs of œdema a fortnight after treatment had been begun.

An equally satisfactory result was obtained in those cases with hepatic enlargement—in every case the liver returned to normal size. In Case 9, for example, where the hepatic enlargement was much more striking than the degree of œdema, the liver was not palpable at the end of a fortnight. The table summarises the results obtained in all the cases, and there are several points to which we would draw attention. Taking, in the case of each drug, the average 24 hours urinary secretion per dose, it is seen that for the novurit suppository this is 87.2 oz. (2470 c.cm.), for novurit given intravenously 121.1 oz. (3435 c.cm.), for salyrgan 91.8 oz. (2600 c.cm.).

The onset of diuresis was more rapid and tended to be less prolonged with salyrgan than with the other two drugs. Thus with salyrgan, taking the average percentage excretion per dose, 81.7 per cent. of the diuresis occurred during the first twelve hours, while with novurit and novurit suppositories the corresponding figures were 67.1 and 68.7 per cent. respectively. Further analysis shows that in the first four hours the average percentage excretion per dose was 44.9 per cent. for salyrgan, 25.9 per cent. for novurit, and 23.2 per cent. for novurit suppositories.

Table showing the Twenty-four Hours Urinary Excretion following the Administration of Mercurial Diuretics

Case.	NOVURIT SUPPOSITORIES.			INTRAVENOUS NOVURIT.			INTRAVENOUS SALYRGAN.		
	With	With-	Total	With	With-	Total	With	With-	Total
	Ammon. chlor.	out		Ammon. chlor.	out		Ammon. chlor.	out	
I. ..	0zs.	0zs.	0zs.	0zs.	0zs.	0zs.	0zs.	0zs.	0zs.
	..	138	138	..	..	..	..	114	114
	..	137	137	..	..	..	..	126	126
	..	88	88	..	..	..	..	..	..
II.	98	98	..	..	..	..	66	66
	..	64	64	..	..	..	..	76	76
	..	89	89	..	..	..	..	88	88
	..	55	55	..	..	..	..	..	..
III.	56	56	..	127	127	..	53	53
	..	114	114	..	..	..	..	..	..
	..	61	61	..	..	..	..	..	..
	..	32	32	..	..	..	..	..	..
	..	140	140	..	..	..	..	..	..
IV.	43	43	..	60	60	..	43	43
	..	69	69	..	..	..	..	..	..
	..	51	51	..	..	..	..	..	..
	..	15	15	..	..	..	..	..	..
V.	40	40	..	189	189	211	..	211
	..	137	137	181	..	181	..	..	..
	..	70	70	..	..	..	..	..	..
	..	191	191	..	..	..	..	..	..
	..	158	158	..	..	..	..	..	..
	..	70	70	..	..	..	..	..	..
	..	134	134	..	..	..	..	..	..
VI.	184	184	154	..	154	108	..	108
	..	206	206	..	..	..	112	..	112
	..	128	128	..	..	..	..	..	..
	..	110	110	..	..	..	..	..	..
VII.	21	21	..	64	64	..	62	62
	..	51	51	150	..	150	..	..	..
	..	76	76	..	..	..	..	..	..
	..	82	82	..	..	..	..	..	..
VIII.	43	43	..	..	..	94	..	94
	..	74	74	..	..	..	..	..	..
	..	47	47	..	..	..	..	..	..
	..	66	66	..	..	..	..	..	..
IX.	92	92	82	..	82	64	..	64
	..	68	68	..	..	..	..	..	..
	..	66	66	..	..	..	..	..	..
	..	57	57	..	..	..	..	..	..
X.	68	68	83	..	83	69	..	69
	..	90	90	..	..	..	..	..	..
	..	84	84	..	..	..	..	..	..
Average diuresis	96.7	78.5	87.2	130	110	121.1	109.7	78.5	91.8
In c.cm.	2760	2230	2470	3690	3120	3435	3110	2230	2600

The corresponding figures for the third four-hourly period were salyrgan 12.1 per cent., novurit 9.5 per cent., and novurit suppositories 14.9 per cent. Diuresis was never maintained beyond twenty-four hours.

The question as to whether it is desirable to secure evacuation of the bowels by means of an enema or an aperient was also investigated. It was found that with a preceding enema the average 24 hours urinary secretion was 98.4 oz. (2790 c.cm.), with an aperient two nights before it was 79.9 oz. (2266 c.cm.), while with neither it was 73.4 oz. (2082 c.cm.). As the numbers are so small, there is probably no statistical significance in these differences, and it may be concluded that the premedication treatment makes little difference provided there has been a satisfactory evacuation of the bowels. It was noted that several patients experienced more difficulty in retaining the suppository after an enema than after an aperient; on this account the aperient should be given two nights before the suppository, as, given

the night before, it would be more likely to leave the rectum in an irritable condition. The aperient used was liquid extract of cascara sagrada in doses of 1 fluid drachm (4 c.cm.).

With intravenous administration of the mercurial diuretics it is the general experience that the preliminary administration of the acid-forming salts results in a greater diuresis. Our figures, though small, support this belief, as in the case of novurit the diuresis with and without preliminary ammonium chloride was respectively 130 oz. (3690 c.cm.) and 110 oz. (3120 c.cm.), while for salyrgan the corresponding figures were 109.7 oz. (3110 c.cm.) and 78.5 oz. (2230 c.cm.). The results with the suppositories were similar, as with ammonium chloride the result was 96.7 oz. (2760 c.cm.), while without it the average 24 hours urinary secretion per dose was 78.5 oz. (2230 c.cm.).

No toxic or local irritative effects were observed except that in Case 1 after one suppository there was a small motion with each passage of urine, but without other upset. Further suppositories produced no such effects; nor did such effects arise in any other patient. All our patients received at least three suppositories in as many weeks (apart from successive intravenous injections), and one (Case 5) received seven within six weeks. The presence of a fissure or inflamed hæmorrhoids should doubtless be a contra-indication to their use. Occasionally the patient had difficulty in retaining the suppository, but even when it was retained for only two hours, the subsequent diuresis was satisfactory—e.g., Case 2 only retained the first suppository for two hours, yet the diuresis was 96 oz., while the second suppository, which was well retained, was only followed by a diuresis of 64 oz. In one case (5) the antecubital veins became so sclerosed that intravenous medication became difficult. This resulted in a slight leakage with the final dose of intravenous novurit. By the evening the forearm had become swollen and very tender and it did not return to its normal size until several days had elapsed. This is one of the disadvantages of intravenous administration, and is just as likely to occur with salyrgan.

DISCUSSION

Digitalis is of primary importance in the treatment of congestive heart failure. Often this is all that is required, but in a large proportion of cases some further therapy is necessary. For persistent dropsy, and even for a persistent hepatic enlargement, the organic mercurial diuretics are now the best means available.

From the results of this preliminary investigation we are not prepared to discriminate between novurit and salyrgan both given intravenously, though the Table suggests that novurit is rather more efficient. The studies of Limova,⁹ Crawford and McDaniel,³ and DeGraff, Nadler, and Batterman⁴ are in favour of novurit.

In order to obtain information concerning the unaided action of these drugs, digitalis was not given either before or with the mercurial diuretics. In practice digitalis would nearly always be given before and with these drugs, and as a result a larger diuresis would be expected.

The main reasons for preferring rectal administration by means of a suppository to intravenous medication have already been stated. Rectal administration will prove particularly useful to a practitioner who does not happen to have regular opportunities for using drugs intravenously. In addition,

there are cases where œdema of the upper extremities renders intravenous medication almost impossible. A further advantage is that the intelligent patient, under full medical supervision, should be able, if necessary, to insert the suppository himself.

The results reported here seem to indicate that as a diuretic the suppository is satisfactory, particularly in view of the fact that the degree of œdema in several members of the series was slight. The diuresis is not as great as with intravenous medication, although a larger amount of the drug is contained in the suppository than in the recommended intravenous dose, but such a finding is only to be expected in view of the smaller absorption there must be in rectal as compared with intravenous administration. Still a diuretic agent so simple to administer and which can produce a flow of 206 oz. (5840 c.cm.) in twenty-four hours and which on an average produces 87.2 oz. (2470 c.cm.) is an addition of value in the treatment of dropsy.

SUMMARY

(1) The therapeutic value of an organic mercurial diuretic which can be given as a suppository, the novurit suppository, has been investigated. This suppository, according to the manufacturers, contains 0.5 g. of novurit, a complex organic mercurial compound akin to salyrgan, but combined with 5 per cent. of theophyllin, in cocoa butter.

(2) Ten cases of congestive heart failure with œdema have been treated with this suppository and also with novurit intravenously and with salyrgan intravenously.

(3) The average twenty-four hours excretion of urine per dose was for the suppository 2470 c.cm. (87.2 oz.), for novurit intravenously 3435 c.cm. (121.1 oz.), for salyrgan intravenously 2600 c.cm. (91.8 oz.).

(4) The previous administration of ammonium chloride results in an increased diuresis with the suppository, as it also does with novurit and salyrgan intravenously.

(5) With the suppositories 68.7 per cent. of the diuresis occurred within the first twelve hours, while the corresponding figure for salyrgan intravenously was 81.7 per cent. The diuresis does not extend beyond twenty-four hours.

(6) No toxic or irritative effects of the suppository have so far been detected. Free evacuation of the bowels is desirable though not essential, and if an aperient is necessary, it should be given forty-eight hours before the suppository.

(7) It is concluded that novurit suppository is an effective and safe diuretic.

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HYPERVITAMINOSIS D

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THE case is that of a baby aged 11½ months whose health had been failing steadily for about four months without any obvious reason; he died four days after admission to hospital, when lesions characteristic of hypervitaminosis D were found in the kidneys.

CASE RECORD

Preliminary history.—In April, 1934, at the age of 4½ months, he was admitted to the Royal Edinburgh Hospital for Sick Children suffering from mild scorbic dermatitis. He was a well-nourished child, the body length being 26 in. and the weight 14 lb. 10 oz.; he had thrived well on artificial feeding, and was taking a reasonable ration of undiluted raw certified milk; he had been perfectly well except for the dermatitis that had been present for about three weeks. He was discharged cured in a fortnight, and brought up for inspection a month later, in June; he was very well, the skin was clear, and he had gained 1½ lb. to 15 lb. 14 oz.; the diet was left as it was—raw milk without any additions. He was not seen again for nearly five months, until he was readmitted to hospital on Nov. 7th, 1934.

History.—His general health had been failing since the beginning of July; he lost his good colour and was always fretful, without actual pain or fever; there was persistent anorexia, with constipation, and he had become steadily worse during the last month. He had not gained weight satisfactorily, and there had been many fluctuations between July and mid-October, when he weighed 16 lb. 10 oz.; then there was a steady loss, and on Nov. 7th he weighed only 15 lb. 13½ oz.—the same as five months before, although he had grown 2½ in. in that time. He had been well cared for, and was out of doors constantly throughout the summer; the home conditions were good, in a pleasant open part of the city; he had been given two treatments with the ultra-violet lamp in October.

The *daily diet* had been as follows. Late June and July: 35–40 oz. of raw Grade A (T.T.) milk with about 1 oz. of sugar added; ten drops of cod-liver oil thrice daily; six teaspoonfuls of orange juice; Virol, for one week only. August: as before, but the milk was cut down to about 30 oz. and one feed of oatflour porridge or some other cereal was given; strained soup and gravy and potato were given occasionally, and the yolk of an egg twice a week; feeding gradually became difficult because of loss of appetite; cod-liver oil was given regularly, and the mother sought to combat the increasing weakness and flagging weight curve by giving as much as half to one teaspoonful (1 to 2 grammes) three times on many days. During September and October the diet was very much restricted because of the persistent anorexia; less than one pint of milk was taken, with a little mixed feeding; cod-liver oil and fruit juice were given as in August, and pressed upon the unwilling child.

Extract from case notes.—He is a pale, thin, and very feeble infant, collapsed but not severely dehydrated; rectal temperature subnormal; no œdema; muscles small and very soft; cranial bones well calcified, the anterior fontanelle being of normal size; eight good teeth. The urine is scanty in amount and strongly acid; there is a trace of albumin, and no sugar or acetone; on microscopic examination of a fresh uncentrifuged specimen a few pus cells are seen—about four to the high-power field; no red blood corpuscles, and no casts after centrifuging. *Staphylococcus aureus* was cultured from the urine, but this was assumed to be a contamination because a specimen taken two days later was sterile; (post mortem, the genito-urinary tract was found to be free of pyogenic infection).

End of illness.—A diagnosis of terminal pyelonephritis was made, but no explanation could be given for the persistent failure to thrive, and for the fact that the urine

was sterile. The urine was alkalinised within 24 hours without improvement in the baby's general condition; there was irregular and increasing pyrexia, and several convulsions with a normal cerebro-spinal fluid; death took place four days after admission to hospital.

POST-MORTEM FINDINGS

A post-mortem examination was performed by Dr. Agnes Macgregor, pathologist to the hospital, who reported as follows.

The body was that of a small, thin male infant. The bones were well calcified and their ossifying junctions appeared to be normal. Apart from slight hypostatic congestion and œdema of the lungs, and mild fatty degeneration of the liver, the only significant pathological changes were in the kidneys. These were swollen, pale, and rather severely congested in a patchy fashion. On section there were found peculiar deposits of a grey granular material, very slightly gritty, which formed a narrow line along the bases of the medullary pyramids. This material could not be expressed or removed by scraping. It was present in every pyramid of both kidneys, but could not be detected elsewhere with the unaided eye. There were no foci of suppuration. The pelves and ureters were healthy.

Microscopical examination.—In certain tubules of the kidney there were deposits of a material which, both with hæmatoxylin and with von Kossa's silver nitrate method, gave staining reactions characteristic of calcium (see Figures). These were the most numerous and largest in the medulla, especially at the bases of the pyramids, but they were present also in the cortex, where they were very small. The calcium-containing material occupied the lumen of the tubules, sometimes completely filling it; in some instances cells attached to the wall of the tubule, or lying free in the lumen, were calcified. Around all the larger and some of the smaller deposits there was some proliferation of cellular fibrous tissue. In the cortex a few glomeruli contained calcium deposits, the affected tufts being swollen and the capillaries obliterated. There were some small foci of mononuclear-cell infiltration, unrelated to calcium deposits; some dilatation of groups of tubules which contained "colloid" casts; parenchymatous degeneration of the epithelium of tubules in the cortex; and slight œdema of the stroma. The arteries were healthy. No evidence of pyogenic inflammation was found. The liver showed slight fatty degeneration. Microscopical examination of lung, myocardium, stomach, spleen, lymph gland, thymus, thyroid, parathyroid, aorta, and various arteries revealed no pathological changes.

Pathological diagnosis.—The lesions in the kidneys were similar to those described in previously reported fatal cases of hypervitaminosis D in the human subject, and closely resembled those produced in animals by experimental administration of excessive quantities of vitamin D.

DISCUSSION

A clinical diagnosis of hypervitaminosis D should have been considered, for the illness resembled very closely that known to be caused by excessive doses of vitamin D and by minute amounts given to infants who are abnormally sensitive to the action of the drug. It was not realised that the baby might have been affected by the vitamin D in the cod-liver oil that had been administered daily in considerable doses throughout four summer months, augmented as it was by that contained in a full ration of fresh cow's milk and by that formed in his tissues under the influence of sunshine—to which he had been exposed a great deal throughout the summer. In addition, he had been given two treatments with the ultra-violet lamp about three weeks before he died; these were not persevered with because irradiation did not seem to suit him. No other cause for his illness was found either before or after death, for the infection of the urine did not indicate a severe infection of the urinary tract. It is known that

he was perfectly well and thriving satisfactorily without any signs of rickets just before the institution of the intensive antirachitic régime that was carried out without remission from June to the end of October.

In 1924 A. F. Hess¹ and also Steenbock and Nelson² discovered that ergosterol was endowed with anti-rachitic properties by exposure to the rays of an ultra-violet lamp, and it was proved that this was due to the formation of vitamin D. More recently the pure vitamin was isolated in crystalline form from this preparation,³ and given the name of calciferol; its potency is about 40,000 international units of vitamin D in a milligramme, whereas a good sample of cod-liver oil contains only about 100 per gramme.

Very soon after the introduction into the practice of medicine of preparations containing irradiated ergosterol reports of its toxicity in certain circumstances began to appear. Experimentally Pfannenstiel⁴ found that a dose 100 times greater, than the minimum antirachitic one did not produce any recognisable effect on rats; one 1000 greater was definitely harmful when taken over long periods of time; and one 10,000 greater was strongly toxic. Moreover, it was recognised that these ill-effects are exaggerated when the diet is modified in certain ways (especially when it is insufficient or badly balanced), that young and non-rachitic animals have less tolerance than those that are mature or rickety, and that there is a conspicuous difference in the susceptibility of different species as well as a possibility of individual idiosyncrasy. It is important to note that animals may recover very quickly if the drug is withheld in reasonable time. There is abundant evidence that infants also may react badly

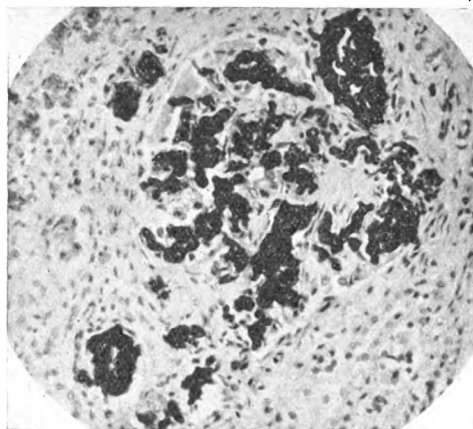


FIG. 3.—Calcified masses of one of the larger deposits showing calcified masses in tubules and slight fibrosis. Hæmatoxylin and eosin. (× 160.)

is abnormal (fretfulness with a strange apathy); there is neither pain nor fever; the weight is likely to be stationary for some time, followed by a steady decline; albuminuria and pyuria seem to be found constantly in the later stages; there may be a rise in the amount of inorganic blood phosphate without a corresponding hypercalcæmia.

The post-mortem findings are conclusive, for they are pathognomonic of hypervitaminosis D. We do not know of any other agent, or any disease, that will cause the characteristic deposition of calcium salts in the tissues; it is found always in animals that

have been poisoned with vitamin D, and is most abundant in the kidneys and urinary passages—where there may be calculi—and in the walls of the great arteries. The state of the kidneys in the case reported in this paper is similar to that described in the two other cases of hypervitaminosis D affecting babies in which the diagnosis was established by careful post-mortem examination^{11 12}; calcification of other tissues has not been seen in the human subject.

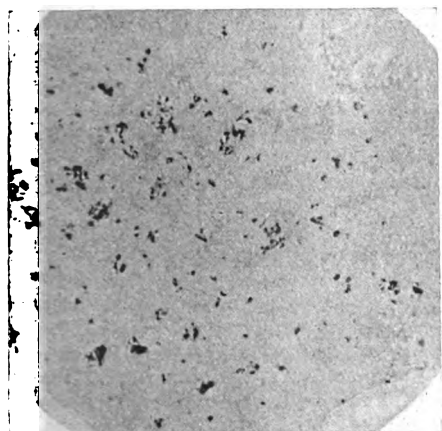


FIG. 1.—Section through base of pyramid showing calcium deposits. von Kossa's stain. (× 35.)

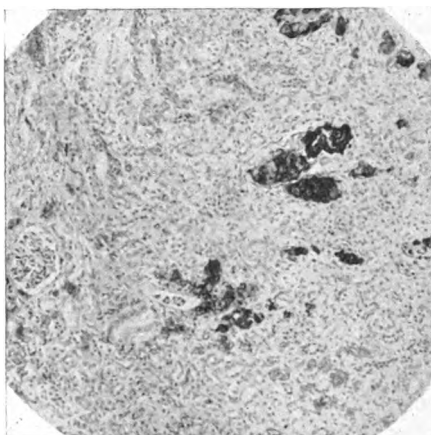


FIG. 2.—Calcium deposits in tubules at base of medullary pyramid. Hæmatoxylin and eosin. (× 75.)

to "safe" doses^{5 6}; there may be a true idiosyncrasy. It has been found that undue susceptibility is most common in premature or feeble infants, and in those that are not rickety; in addition, tolerance may be lowered by feeble illness and by exposure to the rays of the sun and of the ultra-violet lamp.⁷⁻¹⁰

The indications that vitamin D is exerting a toxic influence may be summarised as follows. There is failure of general health without obvious cause, and progressive asthenia is associated with marked atony of the muscles; persistent anorexia is a striking feature; there may be vomiting and slight diarrhœa at first, followed by constipation; the mental state

I can find the record of one case only in which fatal illness may have been caused by the vitamin D contained in cod-liver oil.

Malmberg,¹³ following the work of Agduhr and other Scandinavian workers, reported the case of an infant one week old who was given half a teaspoonful of the oil daily. It disagreed, causing vomiting that ceased immediately the oil was withheld; it was given again about a fortnight later in half a teaspoonful dose twice a day; this was increased soon to a teaspoonful at the same times, and was continued in this amount until the baby died when she was 4 months old. The diet was human milk, fruit juice, and a little butter gruel occasionally. There had been inexplicable failure of health for several weeks before

death; the weight was stationary, but loss was obscured by the presence of subcutaneous œdema; there was neither vomiting nor diarrhoea; the state of the urine was not described. Post mortem, the only significant findings were degenerative changes in the myocardium and elsewhere similar to those found in experimental animals that had been given excessive amount of cod-liver oil for a long time; but the deposition of calcium in the urinary tract was not noted and, therefore, the case cannot be accepted as one of hypervitaminosis D.

It is common experience that a reasonable dose of cod-liver oil is extremely well tolerated by infants, and that digestive disturbance may be brought about by injudicious use of it. The signs, as a rule, are those of gastro-intestinal irritation with diarrhoea, and they clear up quickly when the oil is withheld, or a smaller dose given. It is conceivable that ill-effects might be brought about if intestinal peristalsis was unhurried, permitting more complete absorption, and especially in the presence of constipation that seems often to accompany vitamin-D poisoning.

It is important to know that the vitamin-D content of cod-liver oil has been definitely increased during the last few years; the monopoly that it enjoyed as an antirachitic agent was broken by the introduction of numerous well-advertised preparations containing calciferol—the potency of which is made much of—and this intensive competition had to be met. Not long ago many samples contained little or no vitamin D; now most of the oil that is sold is standardised to contain a certain number of international units per gramme. I have ascertained the certified potency of eight samples that are available on the British market; five popular brands contain about 100 international units, one has 140, one 160 (both of these are fortified by the addition of halibut oil), and one 200; the latter is a natural Norwegian oil, and was used in the case reported here.

SUMMARY

The case is that of a baby aged 11½ months known to be thriving and free of rickets just before the addition to the daily diet—at the beginning of June—of a considerable dose of cod-liver oil with an exceptionally high vitamin-D content. He had been brought up on raw cow's milk, fruit juice, and the customary amount of mixed feeding; he was out in the open air and sunshine a great deal, and had been given abundant opportunities for muscular exercise. He died early in November after an illness similar to that described as being caused by hypervitaminosis D. Post mortem, changes pathognomonic of that condition were found in the kidneys.

CONCLUSIONS

Young infants may have idiosyncrasy to the vitamin D contained in cod-liver oil as well as to artificially prepared calciferol. The present-day tendency to increase the vitamin-D potency of cod-liver oil is undesirable and unnecessary; that to which the public is accustomed, and upon which popular dosage is based—viz., about 100 international units per gramme—is sufficient for all purposes. There is no reason whatever to administer cod-liver oil to infants during the summer months when diet and hygienic conditions are satisfactory and there is no evidence of rickets.

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B. AERTRYCKE FOOD POISONING

DUE TO CONTAMINATION OF FOOD WITH EXCRETA OF MICE

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THE details of this small outbreak of food poisoning caused by *B. aertrycke* (*Salmonella typhi murium*) have appeared worth recording because the source of infection seems to have been definitely proved to be food contaminated with mouse faeces and also because of the impression we have formed that the completeness of the chain of evidence was due to the use of tetrathionate broth and brilliant green-eosin agar.

The outbreak involved five members of one family, living in conditions of poverty and squalor in a poor quarter of Liverpool.

The first case was a child of eight months who was admitted to Fazakerley hospital for infectious diseases on Oct. 22nd, 1935, with a large abscess in the left buttock and smaller ones in the right groin and on the dorsal surface of the left wrist. He was in a somewhat collapsed condition and suffered from diarrhoea which, the mother stated, had lasted for some days. The condition gradually became worse and the patient died on Oct. 27th. A specimen of faeces examined on Oct. 23rd yielded a heavy growth of *B. aertrycke*, largely in the group phase. At a post-mortem examination on Oct. 28th the abscess was found to be due to *Staphylococcus aureus* and was peculiar in that it contained a large mass of necrotic fat and subcutaneous tissue, about 3 in. by 1 in., lying free in the cavity. Changes in the bowel were those of slight inflammatory congestion and in the other organs those associated with toxæmia. *B. aertrycke* was isolated from the contents of the stomach, jejunum, ileum, ascending colon, and rectum, and from the spleen and heart blood. Serum collected at autopsy agglutinated salmonella group suspension in a dilution of 1 in 640 and *B. aertrycke* (type) suspension at 1 in 320.

On further inquiry it was ascertained that the father, mother, and two sisters of the dead child had all begun to suffer from diarrhoea on Oct. 24th, two days after the child had been removed to hospital. The attacks were mild and lasted in one case for one, and in the others for three days. Specimens of faeces from all four cases collected on Oct. 30th yielded cultures of *B. aertrycke*. Sera collected from three of the patients on Nov. 8th agglutinated standard suspensions as follows:—

	Salmonella group.	Aertrycke type.	Aertrycke O.
Patient A ..	1 in 20	1 in 40	Nil
„ B ..	1 in 80	1 in 40	1 in 80
„ C ..	Nil	1 in 40	1 in 80

In view of the age of the first patient (8 months) and the nature of the infection it was suspected that

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milk might be the vehicle of infection and mice the source. Through the courtesy of the medical officer of health for Liverpool (Prof. W. M. Frazer) it was possible to examine six mice trapped in the house between Nov. 5th and 7th. From the intestinal contents of one of these *B. aertrycke* was isolated. The intestinal contents and spleen of the other five failed to provide cultures of this organism, as also did the spleen of the mouse whose faeces contained *B. aertrycke*.

A partly used tin of a dried milk preparation with which the child had been fed was fortunately available for examination. This was found to contain several pellets of mouse faeces of which four were examined, and from one *B. aertrycke* was isolated.

It seems reasonable to suppose that the infant was infected via the milk and that this had become infected by contamination with mouse faeces. So far as could be ascertained no other member of the family had consumed any milk and it is possible that they may have been infected from the first case. At the coroner's inquiry it was made clear that the conditions in the house and the habits of the inmates were such as to render this highly probable.

The possibility that rats or mice might be the source of infection in some outbreaks of food poisoning has been suggested by several workers, notably Bainbridge (1912) and Jordan (1931), in view of the fact that rodents are not infrequently found infected with organisms of the salmonella group under natural conditions. Most workers have found *B. enteritidis* (Gaertner) the infecting agent in rats, while in guinea-pigs and mice it is more often *B. aertrycke*. But although outbreaks have been traced by various authors (Shibayama 1907, Willfuhr and Wendtlandt 1921, Spray 1926) to the contamination of food with "rat virus" this has usually been due to direct contamination of utensils without the intervention of the mouse or rat. The only instance of association with naturally infected mice which we have been able to trace occurred in the outbreak described by Salthe and Krumwiede (1924) which appears to have been well established. Another possible case is the outbreak No. 51 in the series recorded by Savage and Bruce White (1925), though the mice in this instance were not examined until some weeks after the outbreak occurred.

We have been unable to obtain any evidence that "rat virus" was employed for rodent destruction in the neighbourhood where these cases occurred. As most of these viruses contain *B. enteritidis* (Gaertner) the infection is unlikely to have come from such a source. The house was found to be badly infested with mice and little or no effort had been made to protect food from them.

We have been interested to find that Williams, Murray, and Rundle (1910) recorded a group of seven cases of "summer diarrhoea" in Liverpool from which they isolated organisms of the salmonella group. The first of our series might easily have been so diagnosed.

The ease with which the chain of evidence has been established in this outbreak is in no small part due to the use of specially satisfactory media. These have consisted of an enrichment broth containing sodium tetrathionate prepared as described by Schäfer (1935) following Müller (1923) and an agar medium containing brilliant green and eosin described by Teague and Clurman (1916) and recommended by Meyer and Stickel (1918). We have found this combination extremely valuable in the isolation of all members of the typhoid-paratyphoid group

but apparently of no value for dysentery bacilli. Kauffmann (1930, 1935) has also reported very favourably on the employment of a modified tetrathionate broth for the investigation of intestinal infections. As these media appear to be so satisfactory we think our experience may be of interest to those engaged in the investigation of these conditions.

We wish to express our indebtedness to Prof. Frazer and his staff, especially to Dr. B. T. J. Glover, for assistance in obtaining material for examination and for data regarding the onset of the attacks, and to Dr. A. E. Hodgson for the opportunity of investigating the first case and for clinical information.

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Clinical and Laboratory Notes

"MORBUS BRITANNICUS"

A FORM OF FIREMAN'S CRAMP

By Sv. E. KOFOED, M.D.

MORBUS BRITANNICUS is the name we have given a special sort of fireman's cramp, seen very often among the sailors of British trawlers coming to the Faroe Islands. It is never seen among Scandinavian sailors. In the "Ship Captain's Medical Guide" (London, 1929), by D. D. F. Macintyre, the disease is described as follows:—

"Firemen are peculiarly liable to a severe form of cramp, which affects the muscles of the belly, arms, and legs. The patient is usually discovered groaning and writhing on the deck, with his extremities curved, in excruciating pain, and his muscles drawn into hard rigid knots. . . . There may be frequent watery stools and signs of collapse. . . . The complaint is specially prevalent after leaving home ports, and decreases when well in blue water. . . . It attacks men who drink large quantities of cold water when the body is overheated. . . . Treatment: As the condition is due to deficiency of salt in the system, the treatment should be directed towards rectifying this deficiency. A pinch of salt should be put in every drink the men take in the stokehold. A hot salt-water bath will afford speedy relief. In bad cases an enema of warm salt solution—a teaspoonful of salt to the pint of water—may be given. . . . Other treatment is to rub the affected parts with turpentine liniment and to give a dose of cramp mixture, which may be repeated in half an hour if necessary."

The picture of the illness we have seen in the Faroe Islands, and which we have given the name of morbus Britannicus, is not quite identical with the one given by Macintyre, but there are so many points of similarity that we conclude that it must be fireman's cramp. Of the 30 patients in whom we have made this diagnosis, 10 were firemen, 6 trimmers, 3 engineers, and 5 cooks, and 6 had other occupations. Eleven were less than thirty years old, 11 between thirty and forty, and 8 more than forty.

The symptoms include headache, abdominal pain, and constipation—sometimes diarrhoea, but more

frequently constipation, which must be emphasised as a feature differing from the above description. Further were observed nausea, vomiting, and pain in the muscles of the belly, arms, and legs. The pain is often very alarming and spasmodic; only seldom have we seen generalised tonic and clonic spasms—namely, in cases when the disease has lasted a very long time, or where there was complicating organic stenosis of the pylorus. There have been only 5 cases with generalised spasm.

We have not seen fever. The pulse is ordinarily normal, in some cases a little more rapid than usual. The patients are pale, shocked, and apathetic. The spasm of the belly can be so intense that it looks like a regular pseudo-defence. This we have seen in 10 cases. It is therefore easy to understand that the diagnosis may be difficult, because the question of ulcer, cholelithiasis, or appendicitis arises. The patients may be suffering from terrible pain and the muscles iron-hard. The abdomen is boat-like, retracted, and diffusely painful. The spasm takes all the muscles of the abdomen more specially the recti abdominis. Therefore one considers first of all the possibility of a perforation with consequent peritonitis; but the picture is usually less violent, there is less shock, and pulse and temperature are not affected. Also flatus is usually free. Nevertheless we have in 3 cases very nearly diagnosed appendicitis, in 1 case cholelithiasis, and in 2 cases gastric ulcer.

In such doubtful cases it generally suffices to observe the patient carefully for some hours and give a small glycerin enema. Then we see opening of the bowels, and the patient will pick up. If one thinks of the possibility of fireman's cramp one is almost sure to get information about pain in the muscles of the arms and legs and find tetanic and rigid muscles.

We have the impression that the abdominal spasm comes first, perhaps because there is constipation. Another question is connexion with sea-sickness. We have no doubt that this is often present and partly causes the headache, nausea, and vomiting. Fireman's cramp is due to loss of salt by sweat, and naturally this is aggravated by sea-sickness, where there is loss of chlorine ions by vomiting, which in itself can lead to gastric spasm.

We have also seen cases of *ulcus ventriculi* complicated with morbus Britannicus. In one of these there was a violent spasm of pylorus accompanied by universal tonic spasm. The very ill patient was most strikingly relieved by two intravenous injections of 5 c.c.m. 10 per cent. of calcium chloride. Later a radiogram showed great dilatation of the stomach due to a duodenal ulcer. The other patient had a less violent attack of spasm. After the attack we discovered distinct symptoms of a stenosing ulceration of the stomach, and he was operated upon by a retrocolic posterior gastro-enterostomy. Since then he has been well and he is now cook in a trawler.

Remembering Prof. J. S. Haldane's researches into "miner's cramp," we have looked for chlorides in the urine. These were never completely absent, but the reaction was very weak in spite of the small diuresis. We have not yet been able to make quantitative researches on the chlorides in urine and blood, but we intend to do so in future. In our cases it seems that the amount of chlorine is more important than the amount of sodium chloride, and we have seen good results from calcium chloride per os, per rectum, or intravenously. Experienced captains believe that starvation and excesses are predisposing causes; also previous diseases. We have seen a case of morbus Britannicus occurring just after a bad

attack of malaria, and this was in a trimmer forty years of age who had been at sea for many years all over the world. As a direct cause bad weather is almost always observed.

We have never seen this disease among the fishermen of the Faroe Islands, and I think this is due to the salt food of these men. Sea-sickness is the same for British and other sailors, and so cannot be the cause of the prevalence among British sailors.

Morbus Britannicus is rather an important disease on British ships, which is proved by the fact that we in Klaksvig (in the northern part of the Faroe Islands) in the last three years have treated 180 British sailors, of whom 30 were suffering from this disease. We shall therefore conclude by suggesting that salt meat should be introduced as a part of the food on British ships, because this has proved to be preventive against the illness on Scandinavian ships. The treatment recommended in the "Ship Captain's Medical Guide" has not been effective, because the men are sea-sick at the same time and vomit the salt drink recommended, and usually do not trust themselves to give enemas. Prevention is most certainly in these cases best.

SEVERE SYPHILITIC ANÆMIA OF THE PERNICIOUS TYPE

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SYPHILIS is a common disease and pernicious anæmia by no means rare, and yet the combination of the two diseases in the same patient is not often seen. In cases of severe anæmia with a positive Wassermann reaction it is usual to follow Stokes's classification¹ which is as follows:—

- (1) True pernicious anæmia with a false positive Wassermann reaction.
- (2) True pernicious anæmia in association with syphilis.
- (3) Severe anæmia due to syphilis.

We believe that the following case belongs to the third group, and we have therefore endeavoured to trace any previous case, clinically and hæmatologically resembling pernicious anæmia, with a positive Wassermann reaction showing no response to stomach extract, but restored to normal by antisppecific measures only. We have been unable to find any record of such a case.

In the days before liver and stomach extract therapy, Labbé² in 1906 reported a case of severe anæmia in a syphilitic which failed to respond to iron but was cured by mercury; Nathan³ in 1914 reported a case of pernicious anæmia and syphilis cured by antisppecific measures only; while Naegeli⁴ had a case of pernicious anæmia and tertiary syphilis which responded to arsenic and mercury, in 1893, and was well when seen in 1918. Since the introduction of liver by Minot and Murphy, de Lillo⁵ has reported a case of pernicious anæmia and syphilis, cured by antisppecific measures only, but the effect of liver or stomach extract was not tried. The following case, therefore, appeared to us to be of interest:—

History.—The patient, a man aged 48, was admitted to the Royal Masonic Hospital on Oct. 14th, 1934,

	1934.							1935.				
	Oct. 16th.	Oct. 30th.	Nov. 17th.	Nov. 30th.	Dec. 6th.	Dec. 13th.	Dec. 20th.	Jan. 3rd.	Jan. 14th.	Jan. 22nd.	Jan. 31st.	May 31st.
Red cells (millions)	1'480	1'530	3'090	3'150	3'610	3'510	3'460	3'740	4'280	3'940	4'930	5'460
Hb. per cent.	36	40	64	65	66	74	71	79	79	76	94	104
Colour-index	1'2	1'29	1'03	1'03	0'92	1'06	1'03	1'05	0'93	0'96	0'96	0'95
Anisocytosis	+	+	..	..	..	..	..	+	..	+	..	..
Poikilocytosis	+	+	..	..	..	..	..	+	..	+	..	..
Punct. basophilla..	..	..	..	..	..	..	..	..	..	..	..	..
Polychromasia	+	+	..	..	..	..	..	..	..	..	..	..
Normoblasts	..	..	..	..	..	..	..	..	..	..	..	..
White cells	5000	5000	6000	7000	5000	8000	8000	7000	7000	7840	5440	8400
Polymorphs	31'0%	38'3%	..	..	..	..	..	64'3%	..	52'2%	53'0%	49%
Small mononuc.	64'7%	51'7%	..	..	..	..	..	26'7%	..	26'3%	17'0%	21%
Large mononuc.	2'7%	4'0%	..	..	..	..	..	4'0%	..	8'6%	8'0%	16%
Eosinophils	1'6%	6'0%	..	..	..	..	..	..	..	6'6%	10'5%	10%
Mast cells	0'0%	0'0%	..	..	..	..	..	5'0%	..	6'3%	11'5%	4%

complaining of nasal catarrh of some ten months' duration. On admission his pallor was such a striking feature that it was apparent that there was something more seriously amiss than nasal catarrh, and, on being questioned, he admitted that he also suffered from dyspnoea on slight exertion, palpitations, giddiness, and feelings of pins and needles in both arms and legs. His occupation was that of an accountant, and he had a wife and family, all in good health.

Examination.—The mucous membranes were pale and the patient had a bilateral malar flush. He was somewhat thin, his weight being 8 st. 9 lb. 7 oz. His tongue was smooth with atrophy of the papillae, his teeth false. The heart was clinically slightly enlarged to the left, and a loud blowing systolic murmur was audible in all areas; the blood pressure was 140/70 mm. Hg; examination of the optic fundi revealed much pulsation in the retinal veins, together with the presence of opaque nerve-fibres on both sides. The liver and spleen were both palpable. No abnormal physical signs were detected in the respiratory or central nervous systems, and examination of the urine was negative. The patient also presented a rash, and this was seen by Dr. A. C. Roxburgh who reported as follows: "Psoriasiform shiny scaly papules elbows and backs of hands. Peeling areas both palms."

Response to treatment.—Clinically the case was one of pernicious anaemia and the patient was placed on adequate doses of stomach extract by mouth. He was also given a mercurial ointment to be applied to the areas affected by the rash. A blood count and fractional test-meal appeared to confirm the diagnosis, as the laboratory reports show.

On Oct. 25th he complained for the first time of nausea with abdominal discomfort, and in view of the absence of free hydrochloric acid as shown in the test-meal, he was given a mixture containing pepsin and dilute hydrochloric acid at meal-times. There was no clinical improvement in his condition, so that we were not unduly surprised when a blood count on Oct. 30th also failed to reveal any progress. On this date he was again seen by Dr. Roxburgh, who made a note that the psoriasiform patches had almost disappeared. The fact that a rash, affecting both palms, had rapidly improved on an ointment containing mercury seemed suspicious, and on the same day a blood Wassermann reaction was done and found to be strongly positive. We thereupon decided to try the effect of antispecific measures alone. All previous therapeutic measures were abandoned and the patient was placed on a mixture containing pot. iod., grs. 10, and liq. hydrarg. perchlor., ℥ 30 t.d.s., p.c. The next blood count, a fortnight later, showed a 100 per cent. improvement, and the dose of potassium iodide was increased to grs. 15 and of liq. hydrarg. perchlor. to ℥ 45. The next count, on Nov. 30th, showed no improvement, and the dosage of potassium iodide was increased to grs. 20 and the liq. hydrarg. perchlor. to ℥ 60. On Dec. 6th the blood count had again improved, the red cells having increased by nearly half a million, and on Dec. 13th, although the red cells were approximately the same, the hæmoglobin had risen by 8 per cent.

The next blood count was disappointing, and so intravenous N.A.B. (nearsphenamine) was begun, the first dose of 0.6 g. being given on Dec. 21st. This was given at weekly intervals while the patient remained in hospital,

with a steady improvement in the blood picture. The patient's general condition also improved enormously; all his symptoms disappeared, including profuse night sweats, concerning which he had complained bitterly, and he was discharged on Feb. 11th, 1935, having gained over a stone in weight since admission.

On May 30th he was readmitted to hospital for estimation of progress. Since his discharge from hospital he had returned to business and had been taking Hutchinson's pill, 2 t.d.s., p.c. Apart from this, he had had no treatment since leaving hospital. He looked and felt a new man, and a blood count on May 31st was normal with the exception of a rather high colour-index. After a further test-meal, and a blood Wassermann reaction which proved to be still positive, he returned home on June 2nd. Five more N.A.B. injections were given in June and July, and in a letter written in December he states that his health is excellent. He continues to take Hutchinson's pills.

Laboratory investigations.—Fractional test-meals on Oct. 18th, 1934, Jan. 24th, Feb. 8th, and June 1st, 1935, all showed a complete absence of free hydrochloric acid and a very low total acid curve. Blood Wassermann tests on Oct. 29th, 1934, Jan. 23rd and May 31st, 1935, were all strongly positive. The blood counts are set out in the accompanying Table.

DISCUSSION

A case is described presenting symptoms, signs, and blood picture closely resembling Addisonian pernicious anaemia with, in addition, syphilis; the disease failed to respond to adequate doses of stomach extract, but showed a gratifying improvement under antisiphilitic measures only. We cannot believe that this was a natural remission, unconnected with the therapeutic measures adopted; the improvement both in the general condition and in the blood picture was so steadily progressive, particularly after the administration of N.A.B. was begun, that we feel no doubt that the one was intimately connected with the other.

There remains the problem as to the site of the lesion. Had this been a syphilitic gastritis, causing atrophy of the pyloric and fundus glands (as was suggested by the fractional test-meals), then one would have expected a response to stomach extract, which supplies both hæmopoietin and the anti-anæmic principle. Whether a syphilitic lesion elsewhere in the gastro-intestinal tract could interfere with the absorption of the anti-anæmic principle seems to us problematical. There remain two other possibilities: either that a syphilitic lesion in the liver prevented storage of the anti-anæmic principle (cf. pernicious anaemia in hepatic cirrhosis) or that the bone-marrow was affected in some way by the spirochæte, so that normal formation of the red cells was prevented.

Our thanks are due to Dr. Roxburgh for his reports on the skin condition, to Dr. J. Bamforth for the last

three blood counts, and to Dr. Eastes's laboratory for all the other pathological investigations.

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THE SYNDROME OF CROCODILE TEARS

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HON. AURIST TO THE BOOTLE HOSPITAL

INCOMPLETE recovery after Bell's palsy occurs in about a fifth of the cases observed, and these may be afflicted in a variety of ways. One of the most interesting, and incidentally most distressing, is the syndrome of crocodile tears.

Briefly, this consists of a troublesome epiphora which occurs during mastication. This is to be distinguished from the epiphora which occurs in the early stage of most facial palsies, and which is, of course, due to the paralysis of the orbicularis palpebrarum. The crocodile tears appear late, even in the presence of an active orbicularis, and although some epiphora may or may not be produced by exposure to wind and so on, yet the really copious flow is only excited by the act of mastication. In a severe case the patient is constantly mopping his eye during a meal, and may indeed develop a secondary blepharitis.

Considering the comparative frequency of this syndrome, it is surprising that it should have received such scant attention. In a recent investigation,¹ I found, in confirmation of A. B. Duel's figures, that fully 20 per cent. of Bell's palsy do not recover completely. Out of these incomplete recoveries, no less than 80 per cent. (15 out of 18) showed crocodile tears to a greater or less extent. Three certainly complained bitterly of it.

Theory of causation.—This syndrome is interesting in connexion with the associated movement often seen even in patients who regard themselves as cured. Such a patient is unable to contract one set of muscles without throwing other sets into action. When told to close the eye, he also unconsciously contracts the mouth or nose muscles. This is not to be attributed to spasm or hypersensitivity of the muscles, or to some overflow of energy in the facial nucleus. A much simpler explanation is available as follows: the nerve having undergone degeneration, new axons are pushing their way out seeking their various destinations. Unfortunately some are diverted, and find their way to the wrong muscle or gland. Thus, when, for instance, the nerve centre for the orbicularis palpebrarum goes into action, some of its energy output is carried via aberrant axons to other muscles. An explanation suffices for crocodile tears—i.e., that fibres intended for the parotid gland are diverted to the lacrymal so that during mastication the salivatory nucleus is also bombarding the lacrymal gland with secretomotor stimuli.

Sundry anatomical points are raised by this theory. It seems clear that the lacrymal gland is supplied by the facial nerve, and the actual path postulated is as follows: great superficial petrosal—vidian—sphenopalatine gang. Spheno-palatine nerve—sup.

maxillary division of the fifth. The latter communicates via its orbital branch with the lacrymal nerve, and so reaches the gland. I am not aware of any explanation for this fantastic course, but there seems no doubt that the petrosal nerve really carries lacrymatory fibres. Dandy has shown that in the anterior approach to the Gasserian ganglion, the petrosal is liable to be damaged, and that this results in diminished flow of tears.

The parotid is also supplied by the facial, via the chorda tympani, which sends a branch to the otic ganglion. This disposes of the theory that the glossopharyngeal is responsible via Jacobson's nerve, the tympanic plexus, and the small superficial petrosal nerve. In point of fact, Jacobson's nerve has recently been shown to be sensory, and indeed to be the source of that particular subdivision of glossopharyngeal neuralgia known as tympanic neuralgia.

The pathological and surgical implications of this theory are of considerable importance. To begin with, it is clear that the strangulation (or whatever the lesion is in Bell's palsy) must, in these particular cases have affected the nerve where the petrosal is given off—i.e., in the region of the geniculate ganglion. Such a case would not presumably benefit from a decompression limited to the vertical portion of the Fallopian canal. It would be necessary to uncap the nerve in its paratympanic course—an operation of the utmost finesse. Again, it is possible that we may find in a lacrymatory test some quite valuable information as to the location and severity of the lesion. Whilst absence of epiphora in the early stages of a Bell's palsy might be due to a mild lesion, it is more likely to be due to a severe lesion high up enough to involve the petrosal. It should be possible to differentiate these two types. In the former case, lacrymation would still be present, *but not in the latter*. Such a test would however be complicated by the lacrymatory effect of the sympathetic, and possibly by the action of accessory lacrymal glands. Nevertheless a careful investigation of the tear flow in the various stages of facial palsy would seem to be a promising line of research.

The prognosis in crocodile tears is still doubtful. The syndrome can certainly persist for years, but I have reason to believe that it tends to diminish with the passage of time.

Treatment. if called for, is likely to prove difficult. The most likely line which occurs to me would be excision of the lacrymal gland. Apparently there are enough accessory lacrymals to prevent the development of xerosis. Alternative operations such as ligation of the lacrymal artery, or avulsion of the orbital nerve are likely to be more difficult and probably less satisfactory.

I am happy to tender thanks to the various colleagues who allowed me access to their files for the purpose of abstracting the cases on which this paper is founded.

KING EDWARD VII. HOSPITAL, WINDSOR.—Sir Gomer Berry, chairman of the hospital, and Lord Camrose have each given another £1000 towards the cost of the nurses' hostel. Their contributions, which now amount to £21,741, cover the whole cost of the hostel.

EDENBRIDGE WAR MEMORIAL HOSPITAL.—A new block for consultation clinics and additional nurses' bedrooms is to be erected at this hospital and an appeal for funds is being made. The increased accommodation is much needed and the cost of building and equipment will be about £2700.

¹ *Brit. Med. Jour.*, 1934, ii., 1027.

MEDICAL SOCIETIES

LIVERPOOL MEDICAL INSTITUTION

At the December meeting of this institution, the vice-president, Mr. T. P. McMURRAY, being in the chair, Dr. R. E. ROBERTS read a paper entitled

Radiology in Obstetrics

with special reference to its dependability.

Dr. Roberts considered the various questions which might be put to the radiologist by practising obstetricians, showed with lantern illustrations the ways in which the radiologist would endeavour to answer them, and discussed briefly the reliance which might be placed on the answers. His conclusions were: (1) Radiology in obstetrics has proved to be reliable in the diagnosis of pregnancy after the sixteenth week—sometimes earlier. (2) It gives information on the position and presentation, and on multiple pregnancy or foetal abnormalities, which is more complete and reliable than that obtainable by any other diagnostic means. (3) In assessing the period of gestation where this is in doubt, radiology often gives information considerably more exact than that obtainable by clinical means. (4) Radiology, in skilful hands, gives precise help in assessing disproportion by demonstrating the size of the foetal skull and the measurements of the maternal pelvis: the application of these cephalometric and pelvimeric data is, however, outside the province of the radiologist. (5) In the diagnosis of intra-uterine death, the radiological evidence is reliable if positive; if this condition be suspected a firm negative opinion can only be given if repeated examinations are made. (6) The X ray diagnosis of extra-uterine pregnancy is reliable if direct radiology be followed where necessary by the use of contrast media. (7) In the diagnosis of placenta prævia, two methods of employing contrast media are described: (a) Radiography after the injection of uroselectan into the amniotic sac. This method is open to the objection that the injection is almost certain to induce labour, and that in the radiograms the exact site of the filling defect due to the placenta is not always readily detected. (b) Radiography after the injection of an opaque solution into the bladder and demonstration of an increased gap between the foetus and bladder in placenta prævia. This method is only reliable in the later months of pregnancy in cases of central placenta prævia where a central clot is excluded. Both these methods are in their infancy; insufficient data are available for a firm opinion as to their reliability.

In the discussion which followed, Dr. C. H. WALSH said he was pleased to note that Dr. Roberts only went so far as to claim that he could measure the pelvic brim by his special method, and thereafter leave the obstetrician to decide the mode of delivery. Dr. Walsh maintained that a radiogram of a moderate-sized hydrocephalus is extremely difficult to interpret, and that the final diagnosis rests on clinical findings. With regard to amniography, Dr. Walsh stated that after considerable experience of this method, which he instituted at Mill-road Infirmary, Liverpool, about three years ago, he had come to the conclusion that the introduction of uroselectan into the amniotic sac had a useful but limited place in obstetric diagnosis. It would outline the placental site and would demonstrate beyond doubt an abnormal foetus. The disadvantages of the method were that from the radiological standpoint only an expert radiologist

could interpret the findings, and that sooner or later labour would be induced by its application.

Dr. A. WINFIELD praised the pioneer work done by Dr. Roberts in X ray pelvimetry. Amniography, however, entailing insertion of a needle and risk of abortion, did not appear to be of much practical value, and might well shake the confidence of a patient who had only expected to have a picture taken.

Dr. F. J. BURKE said that in a series of cases he had found amniography safe and, as a diagnostic measure, accurate and helpful in the diagnosis of doubtful cases of placenta prævia. An advantage of the method was to make it possible to demonstrate abnormalities of the foetus which might not be shown by direct radiography—e.g., meningocele. This was possible because foetal soft parts as well as the bony skeleton were outlined. The method by which radio-opaque substance was injected into the bladder was not, in Dr. Burke's view, sufficiently accurate to be of real value. The diagnosis depended on a study of the distance between the posterior aspect of the bladder and the anterior aspect of the foetal skull. To obtain a view in the correct plane demanded the most careful radiographic technique. It was difficult to see how it was possible to diagnose placenta prævia in this way unless the placenta occupied the anterior part of the lower uterine segment, and was actually interposed between the maternal bladder and the foetal skull.

Mr. ST. GEORGE WILSON said that obstetricians did not need exact measurements of the bony pelvis and of the foetal head. What they needed was the foetus presenting by the head in utero at or about thirty-seven weeks, in order to decide whether the foetus would pass through. It was important to remember the factor of uterine action. With regard to the evidence of placenta prævia, he had had a little experience of sodium iodide in the bladder, and he considered it was better than the amniography method in that it did not tend to start labour. However, he recognised that it was only of use in the central and marginal types of placenta prævia. In cases where the uterus was so tense that palpation was of very little use, diagnosis by means of X rays was very valuable.

Mr. R. KENNON read a paper entitled

The Kidney from the Surgeon's Point of View

He drew attention to the large number of urinary cases so indefinite as to require the attention both of surgeon and physician; some had frequency, others hæmaturia or renal colic, which could only be explained as renal congestion or mild nephritis. That normal urine (without casts) could be excreted in the presence of advanced nephritis was evident from occasional reports upon cases of "essential hæmaturia" which had been explored. Normal urine was common in the presence of multiple renal abscesses and perinephritic abscess. Infective nephritis had been overshadowed by the milder term pyelitis on slender pathological evidence. The possibility of acute nephritis of the abdominal type required continued emphasis to avoid a dangerous laparotomy. Subnormal gall-bladder function or a normal hypertonic stomach in ill-health at 60 might be the first indication of oncoming uræmia. Mr. Kennon commented on the swing from alkalisation to the ketogenic diet and mandelic acid. Results were best when stasis was avoided. Delay to recognise when relief of tension by nephrotomy, &c., was

required produced disaster. Nephrectomy performed for essential hæmaturia, often in fear of early tuberculosis, was a serious matter. Renal carbuncle rarely called for nephrectomy. This operation carried a mortality of 7 per cent. for all types of case, and must frequently be preceded by drainage.

In the discussion which followed, Mr. COSBIE ROSS commented on the relative frequency with which cases of uræmia presented themselves as abdominal conditions, and quoted three such examples seen within a period of two years. One was admitted as a case of hæmatemesis, another as acute intestinal obstruction, and a third as pyloric obstruction. An interesting feature of the case of hæmatemesis was that the house surgeon stopped all fluids by mouth, with the result that the patient's condition became steadily worse; when the diagnosis was established, and forced diuresis instituted, rapid recovery ensued. All three cases were subsequently proved to be

uræmic. Mr. ROSS expressed his firm belief that as a means of estimating renal efficiency, the indigo-carmin test was superior to the estimation of urea in the urine collected by means of a ureteric catheter.

Dr. R. W. BROOKFIELD said that the classification of kidney disease was continually undergoing modification. The precise ætiology of many renal conditions was still obscure, and none were more baffling than those cases of undoubted renal pain which were unaccompanied by any demonstrable abnormality in kidney or ureter, and were relieved by renal sympathectomy. He thought it important that surgeons performing operations for calculus should give more than a passing thought to the possible existence of a generalised bone condition still in an early stage of development. In this connexion he referred to a patient with well-marked Paget's disease, recently seen, who had had a renal calculus removed some years earlier.

REVIEWS AND NOTICES OF BOOKS

The Parathyroids in Health and Disease

By DAVID H. SHELLING, B.Sc., M.D., The Johns Hopkins University and Hospital, Baltimore. London: Henry Kimpton. 1935. Pp. 335. 25s.

THIS is an up-to-date and accurate critical review of the anatomy, pathology, physiology, chemistry, and clinical medicine of the parathyroids. Dr. Shelling refers to the rapid progress which has been made in the past decade, especially in the chemical and clinical phases of the subject. He hopes that the monograph will appeal to the investigator as well as to the clinician, and disarms criticism by expressing his fears that the radiologist or surgeon may find the discussion on calcium and phosphorus metabolism somewhat lengthy and involved, that the chemist may find it too brief and sketchy, and that the pathologist may consider his subject neglected at the expense of chemistry or radiology. In order to compensate in part for these shortcomings a bibliography has been appended to each chapter, so that those who wish to pursue further any particular phase of the subject may know at once where to turn for the original source of information.

Under the heading Pathology of the Parathyroids variations are described in number, position, size, and weight. Quotations from six authors show that a good deal of confusion still exists on these simple matters. Dr. Shelling's descriptions and illustrations of the histology of parathyroid tumours are excellent. On this point he quotes in detail the writings of H. M. Turnbull who showed the variability of the histo-pathology of parathyroid tumours in hyperparathyroidism. Thus dark oxyphil cells, ballooned chief cells, or pale oxyphil cells may constitute the bulk of the tumour. In the discussion on the physiology of the parathyroids the effects of total parathyroidectomy and the pathogenesis of parathyroid tetany are discussed in detail. Making the most of the few recorded cases of idiopathic hypoparathyroidism Dr. Shelling quotes at length the work of W. Bauer, A. Marble, and D. Clafin on the metabolism of calcium and phosphorus in this rare condition. The biochemical effects of repeated frequent injections of the parathyroid hormone naturally receive much attention, and details are given of the effects on blood calcium, phosphorus, non-protein nitrogen, sodium chloride, and CO₂.

An illustration of the thorough method adopted throughout the work is the short section on psychosis

in tetany, in which the observations of five authors are recorded. Tetany is discussed under three headings: (1) tetany dependent upon a reduction in the total concentration or an inactivation of part of the calcium in the serum; (2) tetany due to intoxications; (3) tetany due to magnesium deprivation. Table III. gives a useful summary of the differential diagnosis of the various forms of tetany. The long section entitled Hyperparathyroidism and Osteitis Fibrosa exemplifies the good judgment of the author. He gives due consideration not only to skeletal signs and symptoms but also to the four other symptom groups which he calls general, urinary, metastatic, and metabolic. Priority is properly allocated to F. Mandl in Europe and J. C. Aub in America for appreciation of the true significance of hyperfunction of the parathyroids. The differential diagnosis of hyperparathyroidism is discussed under the headings osteomalacia, Paget's disease, renal rickets, osteoporosis, localised lesions in the bones, generalised xanthomatosis of bones, secondary carcinomatosis, leukæmia, Hodgkin's disease, erythroblastic anæmia, and osteogenesis imperfecta. In the critical review of the effects of parathyroidectomy the work of E. D. Churchill and O. Cope forms the basis for discussion. It is disappointing in this section to find such a sketchy description of the bones in generalised osteitis fibrosa; a footnote refers the reader to the work of F. von Recklinghausen and H. M. Turnbull on this subject. A whole chapter is devoted to the relation of the parathyroids to vitamin D, and the last chapter deals justly with those who misuse the parathyroid hormone in therapeutics. Useful appendices supply details as to meals of low calcium and low phosphorus content. The book is attractively printed, and the illustrations, especially those of radiograms and histological sections, are excellent.

We heartily commend this book and wish it the success it deserves.

A Textbook of Bacteriology

By THURMAN B. RICE, A.M., M.D., Professor of Bacteriology and Public Health at the Indiana University School of Medicine. London: W. B. Saunders Co., Ltd. 1935. Pp. 551. 21s.

THIS text-book covers the ground required by the average student of medicine. The author has obviously tried to present the subject in the simplest

possible fashion, and at times his search for simplicity has led him into jejune and popular methods of expression which are undesirable in a text-book. For example, such a statement as "by all means, hands should be kept out of the mouth and should be washed several times a day" may represent laudable doctrine but is best omitted from a 500-page work on bacteriology. On the whole the information given in the book is accurate, though the definition given of a unit of diphtheria antitoxin as "the amount of antitoxin that will neutralise 100 M.L.D. of freshly made diphtheria toxin" is almost enough to disqualify an author from being regarded as a serious exponent of immunology. Chapters on immunity, filtrable viruses, and protozoa give completeness to a book which, if in no way inspired, provides a serviceable enough introduction to bacteriology.

Antenatal and Postnatal Care

By FRANCIS J. BROWNE, M.D. Aberd., D.Sc., F.R.C.S. Edin., F.C.O.G., Professor of Obstetrics and Gynaecology, University of London; Director of the Obstetric Unit and Obstetric Surgeon, University College Hospital, London. London: J. and A. Churchill Ltd. 1935. Pp. 480. 15s.

His sense of the growing importance of antenatal and postnatal care and the inadequacy of its representation in obstetric literature has spurred Prof. Browne to write a book which really meets a need. He starts with a welcome account of development of antenatal care, tracing its history back for four hundred years, and then proceeds logically to consider the management of the patient from her first visit to ascertain whether or not she is pregnant. We observe that he advises a Wassermann test in every case. Prof. Browne explains what importance is attached to an accurate history of past pregnancies and labours and goes on to say that this history "is usually obtained by a senior nurse." This may be all very well in hospitals and clinics, but since the book is presumably designed for practitioners and students we suggest that in a future edition this section might with advantage be enlarged to include a note on the special points in the past history that may or may not be of significance. The paragraphs upon diet in pregnancy are suggestive, but again not sufficiently detailed. Dr. Grantley Dick Read is responsible for Chapter VI, entitled *The Influence of the Emotions upon Pregnancy and Parturition*. It is mainly concerned with parturition, and an expansion of the subject matter to fit the title would be welcome; the section on the mental outlook of the midwife is excellent.

The difficulties and pitfalls of pelvic and foetal mensuration are fully discussed and a vivid picture is drawn of the problems associated with minor degrees of disproportion. The treatment of abnormal presentations and positions is clearly set out; more attention might have been directed to the breech presentation as a possible warning of other and more dangerous complications. The chapters on antepartum hæmorrhage, the toxæmias, and the inter-relationship of pregnancy with various diseases and ailments are on sound orthodox lines.

Only 9 of the 480 pages are allotted to postnatal care; there must be a good deal more that could usefully be said on this subject by such an authority as Prof. Browne. Such subjects as the medicinal induction of labour, specialised diets, and the conduct and scope of antenatal clinics are helpfully discussed in appendices, and a large bibliography completes the work.

If occasionally emphasis seems to be laid on the detection of the abnormal, rather than on the preservation of the normal, it is because the latter aspect of antenatal work is an attitude to be cultivated rather than a discipline to be taught. Prof. Browne certainly conveys this attitude better than do most writers on antenatal care and his book should be of the greatest interest and assistance to all engaged in the practice of obstetrics.

1. Demonstrations of Physical Signs in Clinical Surgery

Fifth edition, revised. By HAMILTON BAILEY, F.R.C.S., Surgeon, Royal Northern Hospital, London. Bristol: John Wright and Sons, Ltd.; London: Simpkin Marshall. 1935. Pp. 287. 21s.

2. An Introduction to Surgery

Third edition. By RUTHERFORD MORISON, M.D., F.R.C.S., Emeritus Professor of Surgery, Durham University; and CHARLES F. M. SAINT, C.B.E., M.D., F.R.C.S., Professor of Surgery, Cape Town University, S.A. Same publishers. 1935. Pp. 367. 15s.

3. The Early Diagnosis of Malignant Disease

By GEOFFREY KEYNES, M.D. Cantab., F.R.C.S. Eng., Assistant Surgeon to St. Bartholomew's Hospital; Surgeon to Mount Vernon Hospital. London: John Bale, Sons and Daniels:son, Ltd. 1935. Pp. 70. 2s. 6d.

1. This admirable book has been still further improved in its new and revised edition. It is a book which every student should read and keep by him. The steps of physical examination are clearly and simply set out and the work is beautifully illustrated.

2. A new edition of this book, originally written many years ago, will be welcomed by student and teacher alike. It fulfils well its purpose, for it supplies an introduction to surgery which can be understood by the novice to clinical work. The method of presentation is simple and effective—altogether a most satisfying work.

3. In this small book the main facts which enter into the diagnosis of malignant disease in different parts of the body are set out clearly and readably, but not in very great detail. When the reader gets over a feeling of slight surprise that its gifted author should have devoted his energies to the compilation of a collection of diagnostic paragraphs interspersed with a few illustrative clinical records he will perceive that these are presented more vividly and with greater precision than the corresponding paragraphs scattered through surgical text-books.

Praktische Anatomie

By Dr. T. VON LANZ, Professor of Anatomy in the University of Munich; and Dr. W. WACHSMUTH, Privatdozent for Surgery in the University of Bonn. Vol. I, Part III. *The Arm*. Berlin: Julius Springer. 1935. Pp. 276. R.M.26.

THE title of this book is somewhat misleading to the English reader, to whom a "practical anatomy" book is a dissection manual. The work is actually concerned with the practical application of anatomy in clinical matters. The authors start with the sound precept that anatomical knowledge is the basis of all correct physical procedure in clinical work; they have produced an interesting and fairly full account of the anatomy of the arm. We would like to see more stress laid on the function of the muscles immediately surrounding the shoulder-joint when

dislocations at this articulation are under consideration. The fact that the head of the radius is always in contact with the humerus constitutes an obstacle to the blind acceptance of the statement here made that shocks passed from the hand to the radius are transmitted by the interosseous membrane to the ulna. The illustrations are semi-schematic and clear; numerous figures representing persons turning their limbs about within hollow spheres marked longitudinally and latitudinally in degrees are of the nature of an acquired taste, but will not prevent—even if they do not encourage—an appreciative reception of this effort to serve the surgical practitioner in his work.

The Stomach and Duodenum

By GEORGE B. EUSTERMAN, M.D., F.A.C.P., and DONALD C. BALFOUR, M.D. Tor., F.A.C.S., F.R.A.C.S., and Members of the Staff, The Mayo Clinic and the Mayo Foundation for Medical Education and Research. London: W. B. Saunders Co., Ltd. 1935. Pp. 958. 45s.

THE authors of this book after surveying the ætiology and physiology of the stomach proceed to describe the useful methods of examination, and discuss the significance of symptoms and the various diseases of the stomach and duodenum. Special chapters are devoted to such subjects as anæsthesia for gastric operations and the medical treatment of inoperable cancer of the stomach, anæmia following operations on the stomach, and other complications which occur after operations on that organ or the duodenum. Chapters of great interest are devoted to such rarities as diaphragmatic hernia, hypertrophic pyloric stenosis in adults, non-malignant tumours of the duodenum, sarcoma of the stomach, and paraduodenal hernia.

The Mayo Clinic stands in the eyes of the medical world as a great surgical institution and it is perhaps scarcely just to criticise this work on the grounds that it seems to show a strong surgical bias. But as the name of Dr. Eusterman is placed first amongst the authors, and medical education and research are mentioned prominently in the early pages of the volume, the prominence throughout the book of surgery at the expense of medicine is a little disappointing. The faint enthusiasm towards medical treatment must leave the average reader with the impression that the therapeutics of every gastric disease consists in the successful application of surgery in order to terminate an illness in which medical treatment has been laudably but ineffectively applied for a considerable period. This surgical bias is to be found also in the suggestion which is made again and again that the risk of malignant change is a strong reason against the medical treatment of gastric ulcer. Thus in Chapter IV. Dr. MacCarty begins by saying that carcinoma is not only the most frequent gastric lesion but it is the most frequent form of cancer found in the human body, and proceeds to state that he has never seen a carcinoma arising from an intact mucosa and that the majority of cancers occur in association with chronic ulceration. Yet in Chapter XVI., which is devoted to the question of carcinomatous transformation of gastric ulcer, we are told that the frequency with which this change occurs is "not of primary importance," and an editorial article is quoted with approval which states "the question of the percentage of gastric ulcers becoming malignant is purely academic." The authors admit that the

majority of gastric ulcers are actually benign and will remain so, but yet produce a series of hair-raising arguments sufficient to convince the average reader that extensive resection is a wise precaution whenever an X ray reveals the presence of an ulcer in the stomach.

Even when the treatment of duodenal ulcer is under discussion we can find nothing but pessimism in the authors' outlook towards medical treatment. They admit that the information available is too slender to provide a final, authoritative answer to a question on the prognosis of duodenal ulcer treated medically. As the result of past experience they have arrived at the conclusion, "which is reflected in the attitude of life insurance companies towards patients who have ulcers," that such patients, as have not been operated on, are substandard risks. It may be comforting to the physicians who endorsed this statement that in England at any rate a man or woman with a past history of duodenal ulcer which has responded well to medical treatment for some years without relapse is more readily acceptable by life insurance companies than a patient in an equally happy condition who has undergone an operation on the stomach.

REPORTS AND ANALYSES

RUSSIAN IMPERIAL STOUT

(BARCLAY PERKINS AND CO., LTD., LONDON, S.E.)

THIS well-known stout before the war was exported to Russia. The sample which was analysed had been 21 months in bottle and had a very full and matured taste. When analysed the following results were obtained:—

Present gravity	1024.04
Alcohol by volume	10.42 per cent.
Equivalent to proof spirit	18.20 "
Matters in solution	9.66 "
These include—	
Maltose	2.53 "
Dextrin	3.22 "
Other carbohydrates, hop extract, &c.	2.41 "
Protein	0.72 "
Acidity (as lactic acid)	0.30 "
Mineral matter	0.48 "
(including phosphoric acid)	0.134 "

This stout on account of its strength and full maturity can be regarded as one of the finest products of the English brewing industry. Its condition—i.e., content of carbonic acid gas—was not excessive, and as a beverage it is most agreeable to the palate.

MONBERNO MEDICATED WINE

(PREPARED BY THE CISTERCIAN MONKS OF MOUNT ST. BERNARD ABBEY, CHARNWOOD FOREST, LEICESTERSHIRE)

This red wine has an agreeable flavour and bouquet which is suggestive of port. When analysed the following results were obtained:—

Alcohol	17.5 per cent. by volume.
Equivalent to proof spirit	30.5 "
Volatilo acidity (as acetic acid)	0.025 "
Fixed acidity (as tartaric acid)	0.42 "
Total solids	15.0 "
Consisting of—	
Sugar	12.1 "
Ash	0.46 "
Phosphoric acid	0.10 "
Meat extract	1.20 "
Other extractives	1.24 "

The claim that this wine contains meat and other extractives is supported.

THE LANCET

LONDON: SATURDAY, JANUARY 4, 1936

THE MARRIAGE OF PUBLIC HEALTH AND AGRICULTURE

THE phrase is Mr. BRUCE'S. He was speaking of the wastefulness of widespread malnutrition at a time when farmers long to produce more crops; he was pointing out that agriculture and public health have one great need in common; and he was urging the governments of the world to divert their subsidies from schemes for restricting production to schemes for enlarging consumption. Here in England this policy finds one of its best exponents in a member of our profession who is also in close touch with farming, Sir JOHN ORR of the Rowett Institute at Aberdeen. In his address to the British Association last September he admitted that price-raising methods such as quotas and tariffs have saved British agriculture from the full effects of the world economic crisis, but maintained that they can be justified only as emergency measures. At a time, he said, when there is a so-called glut of all kinds of food, the continued existence of diseases due to malnutrition shocks the public conscience, and public opinion forces an increase of the already heavy expenditure on social services in an endeavour to get them eliminated. Cheaper food would reduce the cost of such services, for it means less poverty and less disease due to poverty; and Sir JOHN went on to demonstrate that agriculture, as much as public health, stands to gain from an expansive programme. Inquiries jointly made by the Rowett Institute and the Market Supply Commission show that consumption of the "protective" foods—milk, eggs, fruit, and vegetables—rises uniformly with income, and that generally speaking it is not until we reach families with about £1 a week per person that the diet, according to modern standards, is adequate for maintaining health. At present some 20 million of the population are below this scale and if everyone in the country were brought up to the £1 5s. scale, which probably represents an optimum, the market for food would be 20 per cent. larger. He calculates that if we all had as much food as we ought the percentage increases in consumption would be: milk 42, butter 27, eggs 28, fruit and vegetables 53—which "gives an indication of the limit to which agriculture could be developed in this country without reducing imports and therefore without prejudicing our export trade or the interests of

our overseas investments." The Bishop Auckland potato experiment, in which unemployed men bought their potatoes direct from a depôt at 4d. instead of 7d. a stone, showed that there is an ample market for food at lower prices and indicated one way in which these prices can be attained. The better organisation of distribution by marketing boards could, in itself, lower retail prices, and the remaining difference between the price the public can pay and the price the farmer must charge should be made good, in Sir JOHN ORR'S opinion, by direct subsidies to these boards from the State—subsidies to be regarded as more in the interests of public health than of agriculture. "All the money going to the farmer flows back immediately to the towns, invigorates industries and reduces unemployment. None of it is lost to the country. . . The next five years should be devoted to a great constructive policy, based on increased consumption and better utilisation of our wealth, a policy designed to bring about a prosperous agriculture, a better fed people, and increased internal trade."

A voice crying in the wilderness? No. For when Mr. BOOTHBY brought forward some of these arguments in the debate on the Address last month the Government spokesman, Lord EUSTACE PERCY, took pains to show that the investigations on which Sir JOHN ORR'S conclusions are founded were made at the instance of the Government itself, and published in order to awaken public attention to the need for, and possibilities of, a policy of nutrition. Lord DE LA WARR, as Parliamentary Secretary to the Ministry of Agriculture, told the League of Nations' Assembly in September that it is not enough to resist a policy of restriction; something more positive is needed—namely, deliberate action. On Dec. 18th Lord EUSTACE PERCY, receiving a deputation from the Children's Minimum Committee, said that a broad nutrition policy must be one of the main aims of social administration in the immediate future; indeed, he went further and declared that on the main issues there was no conflict between the views of the Government and those of the deputation. If this is true it suggests a definite change of front—a determination, now that trade is recovering, to think in terms of permanent social advantage rather than the requirements of crisis. For the deputation's memorandum set out clearly their demand for a more positive approach to the problem of nutrition, their discontent with the abandoned scales of the Unemployment Assistance Board, their anxiety about the painful reports that come from distressed areas and distressed homes, and their belief that "a great deal more can be done immediately by a more generous development of existing services to safeguard and improve the health of the two sections of the community for whom proper nutrition is of supreme importance—children, and mothers during the child-bearing period." The sharpest edge of the depression, they said, is falling on families with young children, and they outlined schemes by which this national evil can at least be mitigated. Lord EUSTACE PERCY was right when he replied that

a really broad policy can hardly be based on attempts to deal merely with cases of poverty, and that its most important aim must be rather to promote the establishment of sound normal standards of nutrition and physical fitness. But he might equally well have said that such a policy must be based on the recognition that proper feeding is the first necessity for national health—a necessity more urgent and compelling even than good housing or the control of infection or any other of our hygienic aims. At present we are wasting our agricultural resources and we are wasting our human material. In Sir JOHN ORR'S words, we need a national food policy, into which both agricultural and public health interests can be fitted and reconciled.

The science of nutrition has shown the way to a more economical economy, to a more tolerable state of society. It has revealed deficiency diseases; it has described the means whereby they can and must be prevented.¹ But we shall be very much mistaken if we look on this science as merely the analysis of starvation; we should think also of the constructive contribution it may make to human progress. Dr. JAMES MCLESTER took this as his theme for the presidential address² he gave to the American and Canadian Medical Associations last summer, when he spoke of the highly significant discovery that under certain circumstances an animal's life may be greatly improved by the addition of appropriate foods to a diet previously thought satisfactory. In twenty years, he said, OSBORNE and MENDEL were able to treble the growth-rate and double the standard weight of their albino rats; they produced what was in fact a new species, simply by intelligent alteration of the rations. Can the same thing be done for man? The Chinese in Hawaii, the Japanese in San Francisco, grow larger than their compatriots in China and Japan. In this country F. G. PARSONS believes that hygiene and better food have raised the height of the upper classes, while H. H. BASHFORD reports that Post Office messengers get bigger (though not necessarily brighter) from year to year. Where must the process stop? "The mere survival of a community," Sir GOWLAND HOPKINS has remarked, "is too often taken as proof that the nutrition of its constituent individuals is adequate"; but "the community, while managing to survive, may yet be functioning at levels far below those possible to its innate capacities." In other words, MCLESTER says, adequate and optimum are not synonymous, and it may be possible, through improved nutrition alone, to bring mankind to a higher level of physical development—to a larger stature, greater vigour, increased longevity, and a higher level of cultural attainment. Ultimately this is a problem of education and of government; and the first step towards solving it is to ensure that the marriage now arranged between public health and agriculture shall shortly take place.

MORE ABOUT INFLUENZA

AN important communication by C. H. ANDREWES, P. P. LAIDLAW, and WILSON SMITH marks a further advance in our knowledge of influenza.¹ Ever since this team of workers first announced that they had succeeded in isolating a filtrable virus from cases of epidemic influenza, and advanced reasons for thinking it to be the prime cause of this disease,² their findings in subsequent outbreaks have been eagerly awaited. Would it prove that epidemic influenza was due to one and the same virus the world over or would more than one aetiological agent be found? And what about sporadic influenza? would this also turn out to be a virus disease? It was clear from Sir PATRICK LAIDLAW'S Linacre lecture³ that a virus, similar to those recovered from influenza in 1933, had been encountered during 1934 and 1935, but it is only now that the full details of this work have been forthcoming. The winter of 1933-34 saw little influenza in London, but from a small outbreak in March, 1934, a fresh strain of virus was isolated. The next winter, however, proved more propitious for the investigations and eight new strains were obtained, six from an outbreak amongst the troops in Dover and Shorncliffe and two from cases which occurred in London in the early months of 1935. All these new strains have been shown to be identical with those obtained in 1933.

To these findings must be added evidence coming from other parts of the world. In America T. FRANCIS,⁴ of the Rockefeller Institute, has isolated several strains of virus from cases of influenza and shown them to be the same as the English strains. Further, the Hampstead workers have had the opportunity of examining two of these American strains and of confirming the conclusion arrived at by FRANCIS. A recent paper by F. M. BURNET⁵ reports the isolation of a strain of virus from cases of epidemic influenza in Australia; this also was shown to be similar to the English ones. There is thus good reason for thinking that epidemic influenza, wherever it occurs, has the same virus for its prime cause. The causation of sporadic influenza, however, still remains unsolved. Material from 12 such cases has been examined for the presence of virus by the Hampstead team, with completely negative results; and negative also were the results obtained with nasopharyngeal washings from six cases of a type of upper respiratory infection prevalent in the Woolwich garrison in the early months of 1935 and diagnosed clinically as influenza. In the past many have doubted whether all cases labelled influenza constituted an entity and these findings tend to confirm the suspicion.

This latest paper from the National Institute for Medical Research¹ records two disappointments. Attempts were made to infect human volunteers

¹ See the Report on the Physiological Bases of Nutrition drawn up by the Technical Commission of the Health Committee of the League of Nations, p. 1434, reproduced in our columns on Dec. 21st, 1935.

² Jour. Amer. Med. Assoc., 1935, civ., 2144.

¹ Andrewes, C. H., Laidlaw, P. P., and Smith, W.: Brit. Jour. Exp. Path., 1935, xvi., 566.

² THE LANCET, 1933, ii., 16.

³ Ibid., 1935, i., 1118.

⁴ Proc. Soc. Exp. Biol. N.Y., 1935, xxxii., 1172.

⁵ Med. Jour. Australia, 1935, ii., 651.

with the influenza virus, but without success. It should be pointed out, however, that only two volunteers were inoculated and that the authors advance very reasonable explanations for this failure, so that these negative results do not really mean very much. The second disappointment concerns the possibility of infecting mice direct from man. When about 18 months ago ANDREWES, LAIDLAW, and SMITH⁶ reported the successful inoculation of mice with ferret-passaged influenza virus, it was hoped that it would be possible to infect mice direct from man and thus bring influenza research within the reach of laboratories without facilities for keeping ferrets. Unfortunately this hope has not been realised. Human material which took readily in ferrets has regularly failed to infect mice; only after ferret-passage does the virus become infective for the mouse. A further piece of work calls for mention. WILSON SMITH⁷ has cultivated influenza virus. He tried two methods: (1) cultivation in the developing egg, which has been used successfully with a number of viruses, and (2) cultivation in a simple medium consisting of minced chick embryo tissue and Tyrode's solution. The latter method proved by far the most successful and should be of use in providing suitable material for immunisation purposes.

ARTERIAL EMBOLLECTOMY

REPORTS of arterial embolectomy by British surgeons owe their chief interest to the rarity of the operation in this country. Sweden, on the other hand, has a larger experience of it, and J. P. STRÖMBECK⁸ is able to report the late results in 61 cases in which the circulation was restored. These are the successes out of a total of 327. The investigation covers the years 1913-32 and, as it was made in 1934, at least one and a half years had elapsed since the last operation. The immediate mortality in the 327 cases was, of course, considerable, and in STRÖMBECK'S words 207 (63 per cent.) were "discharged from hospital dead." But these deaths were by no means always directly attributable to the operation, since the disease causing the embolism—most often cardiac—is often fatal in itself. Of the 37 per cent. surviving operation, 18 per cent. required subsequent amputation, while the other 19 per cent. were discharged alive, with circulation restored; and it is with these 61 cases that STRÖMBECK'S paper is chiefly concerned.

Only one of the patients was not traced. Of the others, 49 were alive after three years; 43 after five years; and 16 after ten years. At the time of the investigation 41 had already died, the cause of death in all but 2 having apparently a direct connexion with the disease originally causing the embolism. In 28 the cause of death is given as heart failure or as chronic myocarditis or cardio-sclerosis; other complications of the basic heart affection were hemiplegia, renal infarcts, cerebral thrombosis, and chronic nephritis. The after-

history of the patients also revealed a tendency to cerebral circulatory disturbances and to repeated embolism. STRÖMBECK sums up the prognosis after successful embolectomy by saying that, as regards expectation of life, it is essentially the prognosis of the underlying cardiac disease. Further inquiry into the working capacity after operation, and into the local damage to the part of the body affected, showed that the proportion of patients getting back to something like a good working capacity was definitely greater in those that lived longest. Of those who died within three years, at least 70 per cent. never got back to work, and many of them were bedridden. The local results tended to be good; small areas of necrosis, sensory disturbances, and peroneal paresis were reported in one-eighth of the cases.

Mr. GEOFFREY JEFFERSON'S paper read at the annual meeting of the British Medical Association in 1934 stimulated interest in embolectomy, and our issue of last Nov. 30th contained two records of successful operation, together with useful suggestions about technique. Mr. VICTOR RIDDELL pointed to the danger of secondary thrombosis at the site of an embolectomy, and proposed that the artery should be ligatured, above and below the incision through its wall, in cases where the collateral circulation, restored by unblocking of the lumen at the bifurcation of the vessel, appeared to be efficient. Mr. G. R. GIRDLESTONE believed that an attempt might often be made to massage the clot from its situation at the bifurcation of an artery into the less important branch—a plan which would have the advantage of avoiding injury to the intima, and so of lessening the risk of subsequent secondary thrombosis. This suggestion was also made by JEFFERSON. The importance of securing a lasting restoration of the circulation is obvious, and STRÖMBECK describes this as the only means by which we can hope to lower the present high mortality from the operation. A secondary amputation, where embolectomy fails, involves great immediate danger. The only other method available for lowering the mortality is to choose the patients who present the best operative risk, but any improvement in results thus attained is of course more apparent than real. It is clear, however, from STRÖMBECK'S valuable study of after-histories that no very cheerful prognosis is justified as regards restoration to normal life or length of survival.

CO-EDUCATION

OF the human race as a whole at least a half and probably more are co-educated, yet co-education is often spoken of as a difficult problem. It becomes a difficulty under two conditions: (1) when it is not simply a matter of boys and girls learning together, but also of spending most of their leisure together; (2) when co-education is not the usual custom of the community. In England both of these conditions are present. Co-education in day-schools is not the problem that it is in boarding-schools, and in the latter there are further complications associated with

⁶ THE LANCET, 1934, ii., 859.

⁷ Brit. Jour. Exp. Path., 1935, xvi., 508.

⁸ Acta chir. Scand., 1935, xi., 229.

the social class which sends its children to these establishments. Those whose playground is the street, those who have no special play-room at home, are in general, on account of their home experience, less likely to find co-education a personal difficulty, and their parents will in general view it with less alarm—and see fewer dangers—than those who live in an atmosphere of greater, even perhaps too great, exclusiveness.

Boarding-school co-education is in England inevitably regarded as different from ordinary schooling; the sex-segregated schools are thought of as normal, the others as a little peculiar. Under these circumstances it is difficult to exclude the atmosphere of an experimental undertaking, even though the schools in question may have been founded for a long time, because each generation of parents and teachers has to step out of the traditional groove when deciding on this type of school. Parents and staff are apt to become self-conscious regarding co-education, and self-consciousness in the face of a sexual question never helps towards clearness of judgment. The self-consciousness is attributable at least in part to the sense of danger, real or imagined, which attaches to an experimental situation, and is not perhaps quite unrelated to the self-consciousness and the heightened expectancy which precedes the contact of the sexes in later years; at any rate, there are similarities. Whatever may be the real dangers (we must not underestimate the prudence not to speak of the fears of adolescents), the imagined ones in the minds of adults sometimes assume the vividness and even the terminology of actual illicit sexual relations. In addition there is a special sociological terror, the assumption being that pleasure in associating with the opposite sex away from the guarding eye of an adult will, if indulged prematurely (i.e., before the person is economically able to support a home), lead to an insidious dissolution of *all* the standards of conduct and character acquired in the home, and is therefore destructive to the culture which it is hoped that the next generation will maintain, if need be with the same amount of effort expended by the last.

A discussion of co-education that avoids these questions, like the "straight talks" to the young, goes straight past the difficulties. The problem needs simplification, and the first step is to look directly at the psycho-sexual life of the child and adolescent. Co-education was the topic of the December (an "open") meeting of the Medical Section of the British Psychological Society, and the observations of medical psychologists were presented by Dr. LAURA HUTTON. The first fact to emerge is that there is not one but three problems of co-education, corresponding to three phases of psycho-sexual development. The first stage covers approximately the years from six to eleven, and is characterised by a relatively slight degree of sexual feelings, boys and girls tend to treat each other alike. They play and work together and don't think twice about it. The second stage is from eleven to fourteen, in it there is a

prepubertal awakening of interest, but at the same time an affectation of despising or ostentatiously avoiding the opposite sex. This contumely is not genuine and partly arises from a secret shame of sexual feelings, and a dread lest anyone should detect their presence. The scorn is a mask for anxieties which though not objective cannot be neglected. The third stage is that of puberty proper; it begins with a secret acknowledgment of the mutual attraction, but now the defensive aggressive attitude is directed not to the opposite sex as a whole, but to any special and public manifestation of the attraction. When there is an opportunity for the sexes to mix during the third phase there is a period of more rational and quiet friendships, to give place later to deeper feelings directed specially to particular individuals. To speak, therefore, of co-education without considering the changes of the psycho-sexual impulse in the pupils is likely to lead to a drift into meaningless generalities.

A recognition of these changes may illuminate also the special problems of the children in sex-segregated schools—viz., a narrowing of experience at a time when it should broaden, and a tendency to remain at one of the defensive (but normally transitory) positions already mentioned. For example, it is sometimes suggested that the sex-segregated schools are more likely to foster homosexual tendencies than the co-educational, since in the latter (if there is not overt or implicit intimidation) the pupils have opportunity for discovering their feelings for the opposite sex. Investigation shows that homosexual practices in schools do not as a rule have permanently serious consequences. There is however a less transitory kind of homosexual interest which is so deep rooted that it would not be influenced materially by the opportunity afforded by co-education. It is unwise to organise education about a particular sexual problem.

The whole matter requires more investigation; as yet a parent has no criteria to help him decide whether to choose a co-educational or sex-segregated school. The absence of criteria is partly due to the difficulty of the subject, partly to the fact that the child's schooling is one of the last and not least cherished fields for the enforcement of parental authority, and a kind of last ditch in which parental discipline puts up its vicarious fight. Education should not get too much involved in these struggles or it becomes a forcing-ground for faddism, and since there is so much for the pupil to master intellectually in these busy, brainy days it is undesirable for his school years to be burdened by emotionally toned problems of school organisation; those who think the pupils are not keen critics of educational theoreticians know nothing of the facts. So for the sake of pupils and schools alike, there is need for a clearer statement of those matters.

The medical psychologists give us another clinical observation which speaks neither for nor against co-education or sex-segregated schools, but which should do something to dispel alarmist

views as to the dangers of "tampering with education." It appears that character and a *Weltanschauung* are formed in the pre-school period; there is little need to fear that even the most experimental of schools will produce freaks in those having no strong tendency to freakishness; a good school helps the child to develop a strong interest in the people and things

(and occasionally even in "problems") which he finds around him. If the school is to be adapted to the potentialities of the child as well as to the need for continuity of culture in the community, whether the decision be ultimately in favour of co-education or sex segregation, the basis for a wise decision must be a deeper study of the psycho-sexual development of the child.

ANNOTATIONS

THE ACTION OF DUST ON THE TISSUES

It is now generally agreed that the essential process in the development of pneumoconiosis is the solution of the inhaled dust particles; the mere mechanical irritation of accumulated insoluble mineral particles is not sufficient to produce that degree of fibrosis which we associate with silicosis. This conception of the silicotic process is largely due to observations on the tissue reactions which result when silica and other minerals are introduced into other parts of the body than the lung. L. U. Gardner and D. E. Cummins¹ have used the intravenous route and have studied the behaviour of silica introduced in this way into the liver and the spleen. E. H. Kettle² observed the behaviour of dusts injected into the subcutaneous tissues, and J. W. Miller and R. R. Sayers³ investigated the results of injecting dusts into the peritoneal cavity. These observations showed fairly clearly that whereas certain dusts caused a very definite tissue reaction, others appeared practically inert, and it at once became apparent that here was a method which should make it possible to determine whether any particular dust might be expected to produce pneumoconiosis if inhaled into the lungs. In a recent publication⁴ Miller and Sayers have carried the matter still further. Using the peritoneum as their test tissue they have examined 16 different dusts and have found that they may be divided into three clear-cut groups.

In the first or absorptive group the dust was absorbed or disappeared without causing any gross visible damage; calcite, limestone, precipitated calcium carbonate, gypsum, and portland cement fell into this group. In the second or proliferative group—pure crystalline quartz (two samples) and a highly siliceous chert—the dust initiated cellular proliferation followed by fibrosis and retrograde changes. And in the third, inert group, anthracite coal (two samples), bituminous coal (two samples), hæmatite, carborundum, precipitator ash, and soapstone, the dust remained inert in the tissues, neither being absorbed nor causing gross proliferation. Microscopic examination of the lesions demonstrates the essential differences between them. In the early stages of the absorptive group reactions there is a little necrosis, possibly traumatic, but this rapidly disappears, and only a very minor degree of fibrosis results. In the proliferative group both necrosis and fibrosis tend to be progressive. In the inert group there is never any necrosis and fibrosis is always slight in amount. The authors do not refer to the secondary reactions in the associated lymph nodes to which Kettle⁵

attaches considerable importance, but from the observations accompanying their article the lesions they have produced seem to be sufficiently distinctive to justify their claims that the pneumoconiotic potentialities of a dust may be estimated by their technique in as short a period as 60 days.

ACID IN THE STOMACH

EXACTLY three years ago we commented on an aspect of acid secretion which promised to have important bearings on the causation and treatment of gastric diseases as well as of certain general disorders. About this time F. L. Apperly and M. C. Crabtree had shown that the concentration of the gastric hydrochloric acid during a fractional test-meal seems to depend on the bicarbonate content of the blood-plasma; in other words, that the secretion of acid is determined more by conditions of the blood than by what is going on inside the stomach itself. Further studies on the same lines are reported in our present issue in which Prof. Apperly continues his interesting inquiry into the significance of gastric acidity. In bringing together those causes which lead to variations in the plasma CO₂, it is seen that a number of diverse conditions have at least one common factor. For example, direct loss of carbon dioxide may be produced by the over-breathing which occurs in a hot bath, in some fevers, and at high altitudes; it may also be secondary to the formation of lactic acid after severe exercise or to the ingestion of ammonium chloride. There are records showing that in all these conditions gastric acidity is low; likewise it is said to be reduced in the anoxæmia associated with hæmorrhage. Apperly's experiments suggest a further step in his argument—namely, that anoxæmia is not the first consideration, but that hæmoglobin variations in the blood (upon which anoxæmia largely depends) may be correlated with changes in gastric acidity. Thus he goes so far as to assume that when the hæmoglobin content of the blood falls to about two-thirds of its normal value gastric acidity disappears, and in patients with post-hæmorrhagic anæmia he has found that this in fact happens. The idea that the relationship is as simple as this arouses doubts, however, as well as interesting speculations. It seems to be established that in some cases at least achlorhydria often precedes anæmia by long periods, and that some gastric abnormality is the predisposing cause of the blood changes; and though this does not exclude the possibility that in others the gastric anacidity is secondary to the anæmia, it will often be hard to find a primary cause of the initial blood changes. Further, there are undoubtedly some patients in whom the hæmoglobin in the blood is not above 50 per cent., but whose gastric acidity is little if at all below normal. But even if his conclusions are not entirely acceptable Prof. Apperly's paper is valuable because it brings once more to

¹ Amer. Jour. Path., 1933, ix., 751.

² Jour. of Path. and Bact., 1932, xxxv., 395.

³ Jour. Amer. Med. Assoc., 1934, ciii., 907.

⁴ Public Health Reports, U.S. Pub. Health Service, 1935, i, 1619.

⁵ THE LANCET, 1934, i., 889.

the front the non-gastric factors in the regulation of the acidity of the stomach and emphasises the importance of thinking of the general condition of the patient with gastric disorders and not merely of diet and treatment with acids and alkalis. His demonstration of the action of warmth in reducing gastric acidity shows the importance of general measures in the management of conditions associated with hyperchlorhydria, and the well-known effect of fevers in causing anacidity may possibly explain some of the benefit that apparently follows the use of protein substances by injection in cases of peptic ulcer.

UNEXPECTED RICKETS AND SCURVY

Dr. Alan Moncrieff shocked the Physiological Society the other day with a communication entitled "rickets on a diet with adequate cod-liver oil, and scurvy on a diet containing adequate orange juice." The case-records now published¹ illustrate, as he says, difficulties in the simple ætiology assumed for the deficiency diseases. The rickety child, 17 months old, had been artificially fed from birth on a rational diet, supplemented by cod-liver oil in doses of one or two drachms daily or by "another preparation reputed to be 25 times as rich as cod-liver oil in vitamin D," of which she got 1½ drachms a day. Despite this she had all the physical and radiological signs of rickets, and also evidence of tetany (facial irritability and laryngismus stridulus); the serum calcium was 4.3 mg. per 100 c.cm. (ionic calcium 1.9) and the inorganic phosphorus 3.2. There was no evidence of renal disease or coeliac disease, and slow improvement took place under treatment with vitamin D and calcium intravenously. This is a case apparently at the opposite pole from that recorded by Dr. Thatcher on p. 20 of our present issue in which death from hypervitaminosis followed the use of cod-liver oil in doses by no means extremely large. Dr. Moncrieff's second case, moreover, is at least as remarkable, for here the patient developed typical scurvy at ten months, although he had had a good mixed diet and orange juice since birth amounting to half an orange daily for many months. In view of the apparent non-absorption of vitamin C he was given 400 mg. of ascorbic acid intravenously, after which he made a rapid recovery, and it might be interesting to know how he later responds to test doses of the vitamin. These cases are presumably to be regarded as examples of "conditioned" deficiencies, akin to the "starvation in the midst of plenty" of the sufferers from coeliac disease.

DENTAL CARIES AND DIET

A SMALL inquiry into the relation between sound teeth and diet is reported by Dr. Arthur Collett² of Oslo. Of two groups of children under school age, Group A belonged to a closed institution, while Group B consisted of children attending a nursery school but living at home. The latter group stayed at the school from 8.30 A.M. to 4 P.M. daily; their teeth were brushed there and they received a third of a litre of milk and a hot meal; but at home they were allowed plenty of sweets and soft bread, as well as fruit, vegetables, meat, and fish, and the state of their teeth was deplorable. Among 40 children between the ages of three and seven years, there were 584 holes in the teeth—i.e., 14.6 holes per child. (Every ruined or extracted tooth counted as two holes; the 42 teeth thus

classified accounted accordingly for 84 of the 584 holes.) Very different was the dental lot of the 11 children of similar age in Group A. They had 209 milk teeth and 14 permanent teeth, and only 19 holes, 16 of which were already stopped, could be found. These 19 holes were distributed among 11 teeth, and no less than 9 of the 19 belonged to one and the same child who had been admitted to the institution at the comparatively late age of 2-3 years. All the 19 holes were in the milk teeth. The contrast is evident from the fact that while the A children had only 1.7 holes per child and 0.08 holes per tooth, only 4.9 per cent. of the teeth being holed, the B children had 14.6 holes per child. The numerical difference between the two groups was the more striking when correlated with the difference in the size of the holes in the two groups, those in Group A being minute, those in Group B painfully evident. Dr. Collett traces this difference in large part to the dietary of Group A which contained hardly any sweets and included over half a litre of milk (for the older children), home-baked bread containing 50 per cent. whole meal, margarine (no butter), a dessertspoonful of cod-liver oil every day throughout the year, and plenty of vegetables and some fruit. Every meal ended with uncooked fruit or carrots. The tooth-brush and local dental hygiene were dispensed with, apart from the stopping of holes.

ANÆSTHETICS AND SHOCK

THE interrelationship of shock and anaesthesia, a matter of much practical importance, is by no means easy to determine. There is common agreement that insufficient narcosis may, on the advent of a painful nerve stimulus, lead to serious or even fatal shock. These cases are comparable with those in pre-anaesthetic days when a patient fainted or suffered fatal syncope at the first stroke of the knife. They are also comparable with that "psychic shock" which anaesthetists have learned to fear, when the disastrous stimulus is a mental or emotional one. In all these instances it is the absence of anaesthesia or much too light a dose which has made that shock possible. Sir Frederic Hewitt used to say that if consciousness is thoroughly abolished, at any rate when ether is the anaesthetic used, reflex fatal shock of this kind never occurs. At the other extreme, excessive anaesthesia through overdosage can produce a condition analogous to and hard to distinguish from surgical shock. The same effect occasionally follows an endothelial injection. There is, then, close association between insufficient anaesthesia and shock, and between excessive anaesthesia and shock. What may be termed normal anaesthesia is, however, regarded as one of the chief means of preventing shock during surgical operations. The efficiency for this purpose of various anaesthetics and certain methods of anaesthesia have been so clearly demonstrated by Crile that they are now generally accepted. At a recent discussion on surgical shock, given in our columns, one speaker is reported to have said¹ that "fluctuating depths of anaesthesia invariably cause shock." If the fluctuations are so extensive as to reach the two extremes, no doubt the statement is incontrovertible. But if as appears likely from the context, the speaker had in mind variations in anaesthesia within "normal" limits of depth, for example with the corneal reflex at one time abolished and at another allowed to return, we cannot agree with him. Variations of

¹ Jour. of Physiol., 1935, lxxxv., 26 P.

² Tidssk. f. d. Norske Lægefor., Nov. 15th, 1935, p. 1246.

¹ See THE LANCET, 1935, II., 1413.

this kind are constantly allowed in practice by good anaesthetists. During long abdominal operations narcosis is intentionally lightened throughout the period when some anastomosis or other surgical procedure is carried out on insensitive viscera. When the peritoneum has to be dealt with and the abdomen closed the anaesthesia is deepened. In this way the patient receives far less of the drug than he would if he has been kept deeply under throughout the operation, irrespective of its stage or of the sensitivity of the tissues being cut or sewn. Far from facilitating shock, variation of depth in this manner is prone to lessen the risk of shock by reducing the chance of excessive anaesthetic.

THE NEW POISONS LIST

ON New Year's Day the Home Office issued the new list of scheduled poisons, leaving four clear months for its study before the new rules come into force on May 1st. The list is divided into two parts. In Part I. are those substances the sale of which is to be restricted to authorised sellers of poisons, i.e., registered pharmacists. In Part II. are those substances which may be sold only by registered pharmacists and persons registered for the purpose under the Pharmacy and Poisons Act, 1933; this part includes various poisons commonly used for agricultural, horticultural, sanitary, and domestic purposes. The new rules impose certain additional restrictions, including, notably, regulation of the transport of poisons, prohibition of the sale to the public of certain potent medicinal poisons except upon a prescription given by a qualified medical, dental, or veterinary practitioner, and prohibition of the sale of strychnine except for medicinal purposes. Copies of the Poisons List, the Poisons Rules, and the form prescribed for application to be made to the local authority for registration for the sale of the substances in Part II. of the Poisons List may now be had from H.M. Stationery Office.

EFFECTS OF HORMONES ON THE PITUITARY

So much is written about the way in which the anterior pituitary acts on other endocrine organs that one is apt to forget that these other organs also influence the anterior pituitary. The latter is not really a "master gland," since it is in some respects subordinate to the activities of its "subjects"; it is only one of several factors in a dynamic equilibrium. Thus for some years it has been known that histological changes are produced in the anterior pituitary by castration of either male or female, and in castrated animals concurrent increases in the content and output of gonadotropic hormones have been observed. Administration of oestrin to the castrated female has been found to inhibit the histological changes, or to restore the histological picture to normal; but so far the restoration of the anterior pituitary has not been achieved with androsterone, the excretory form of the male hormone,¹ although it has been reported by Migliavacca² for a hormone preparation from urine, and by McCullagh³ for a water-soluble fraction from testes. It remains to be seen whether the recently isolated testosterone will have this effect. As regards less radical changes in the anterior pituitary, which take place without gross histological signs, evidence is rapidly accumu-

lating which bears on the reciprocal action of the anterior pituitary and the gonads and on the mechanism of the menstrual cycle. Many authors have described inhibitory effects of oestrin administration upon ovarian growth and development in the normal animal, but the results in this field are often confusing and contradictory, evidently because of wide variation in factors now recognised to be important, such as amounts and form of hormone administered, period of treatment, and the condition of the animal. As an example of recent work, in which detailed analysis of the effects has been made, we may quote Lane,⁴ who injected oestrin into infantile female rats for varying periods and then examined the pituitaries by removing them and implanting them into a second series of rats. The follicle-stimulating hormone was at first increased in amount above normal, and then inhibited, ultimately completely. Secretion of the luteinising hormone, on the other hand, seemed to be increased throughout the experiment. A stimulating effect of oestrin on the anterior pituitary has been recorded by other authors, for instance by Deanesly,⁵ who observed ovulation in pseudopregnant mice after administration of oestrin, probably as a result of appropriate enhancement of the secretion of follicle-stimulating and luteinising factors.

Dahlberg⁶ has applied the idea of a balance between oestrin and anterior pituitary hormones to explain the inhibition of ovulation in the human being after the liberation of one ovum and the continued repression of ovulation during pregnancy, though he favours the assumption of a direct antagonism in the ovary rather than the mechanism of pituitary inhibition. The experiment in support of this theory consisted in the inhibition, by injection of follicular fluid, of the ovulation normally induced in the mouse by injection of urine of pregnancy (containing prolans). Zondek failed to confirm this phenomenon with injections of oestrin, but other evidence indicated that an inhibition of this type might exist, and Dahlberg claims that the discrepancy is due to differences in the mode of administration. It is known that continual small doses are more effective than a single large dose, owing probably to the rapid destruction and excretion of the water-soluble hormone; oral administration, although the fraction absorbed is less, ensures more continuous absorption, and under these circumstances the original experiments have been confirmed. It seems, therefore, that in the pregnant woman there is enough oestrin continuously in the circulation to prevent ovulation, but not enough to injure the ovaries. When such blood is injected into a mouse in the usual pregnancy test the single dose of oestrin, quickly absorbed and quickly excreted, is not sufficient to interfere with the ovulation produced by the prolans.

Now the anterior pituitary, in spite of the multiplicity of the endocrine-stimulating functions attributed to it, has only three distinguishable types of cell—chromophobes, basophils, and acidophils—the accepted view being that the first type is a reserve or foundation cell which may develop into either of the other two. It is therefore reasonable to suppose that doses of oestrin which affect the gonadotropic activity of the anterior pituitary will have a parallel effect on the other activities if these are exercised by the same cells. Actually suppression of the

¹ Crooke, A. C., and Korenchevsky, V.: Proc. Roy. Soc. Med., 1935, xxviii., 1266.

² Migliavacca, A.: Boll. Soc. Ital. Biol. Sperim., 1935, x., 105.

³ McCullagh, D. R.: Science, 1932, lxxvi., 19.

⁴ Lane, C. E.: Amer. Jour. Physiol., 1935, cx., 681.

⁵ Deanesly, R.: Jour. of Physiol., 1931, lxxii., 62.

⁶ Dahlberg, G.: Jour. Obst. and Gyn. Brit. Emp., 1935, xlii., 953.

diabetogenic activity by œstrin has been demonstrated,⁷ but Shumacker and Lamont⁸ failed to find any effect of œstrin (in doses of 9 "rat units" per day) on the somatogenic, thyrotropic, adrenotropic, or even gonadotropic activities, as indicated by the changes in weight of the body and separate organs after a period of 67 days. Engel⁹ found that the effect of growth hormone on rats was not modified by the simultaneous administration of male hormone or œstrin. On the other hand, Bernhard Zondek, in a paper published in our present issue, has demonstrated that administration of massive doses of œstrin to young rats over a long period not only represses development of ovaries or testes, but has a most striking effect in inhibiting growth, reducing body-weight by as much as 43 per cent. as compared with control animals. In addition, he forecasts the publication of data showing effects on the thyrotropic and other activities of the pituitary, as well as changes in the anterior pituitary itself. Correlating these observations with the recorded result of thyroid feeding on the anterior pituitary and secondarily on the œstrous cycle of rats¹⁰ it seems that we are on the threshold of a closer understanding of the interrelationship of the anterior pituitary and the other endocrine organs, and of the manifold effects of administering a single hormone. Such understanding should lead to a yet more rational system of hormone therapy.

CARRIER LICENCES

THERE would not at first sight appear to be much of particular interest to medical men in a treatise¹¹ on "The Law Relating to Carriers' Licenses, under the Road and Traffic Act, 1933," unless indeed they wished for some strenuous intellectual exercise. The numerous full and complicated enactments from the Railway and Canal Traffic Act of 1854 to that of 1933 offer an intricate study for anyone rash enough to attempt their understanding without a training in the law. Mr. Maxwell has set out to make their principles and precepts clear to all those concerned with transport on the roads. And it is here that the doctor will find his curiosity justified if he looks into this volume; indeed, he may see a certain cause for alarm. Mr. Maxwell shows him that he is, according to the wording of the law, subject to penalties in which he could not expect to be involved by the ordinary use of his car. Here is one passage from the chapter on offences: "the conclusion can hardly be avoided that every motor car fitted with any kind of convenience for carrying the luggage or effects of passengers or any other kind of load is a goods vehicle, and that a license is required to carry anything in any motor car in connection with a business. . . ." This definition seems certain to include the car in which the doctor carries his case of drugs, his emergency outfit, his anaesthetic bag, and so on. Later on comes the more specific statement: "if an engineer needs a license to carry his tools a surgeon should need a license to carry his instruments," and the author goes on to show that the typist might need one to carry his typewriter, and

perhaps the barrister to carry his briefs. It appears that much of the drafting of the bills governing traffic is faulty, making the clear meaning of the law difficult to discern and indeed, if taken strictly, not seldom reducing the law to absurdity. Mr. Maxwell, an authority on railway law, has been impressed with the necessity of clearing up the muddle if people are to have a fair chance of evading liabilities for which they are unlikely to realise their responsibility, and his book should be of service to the many persons who become involved in litigation through incidents of road travel of one kind or another.

HEPATIC LESIONS IN CONGENITAL SYPHILIS

THE morbid anatomist nowadays sees relatively little of the lesions of acquired syphilis, at any rate in a frank and easily recognisable form; the gumma has become a rarity and even syphilitic aortitis is nothing like as common as it was. Still more uncommon are the lesions of the congenital form of the disease, for antenatal and infant welfare and venereal disease clinics are making their influence felt, not to speak of the increased vigilance in this direction of the general practitioner. Nevertheless, from time to time an unhappy infant slips through the therapeutic net and may in due course present very puzzling problems to the unwary pathologist. In a scholarly article in the recently established *Indian Journal of Venereal Diseases* (1935, i., 183) Dr. P. Ramachandra Rao discusses in detail the manifestations of congenital syphilis as seen in the liver. This organ, as he points out, is particularly liable to be affected by the disease, for the maternal blood passes directly to it through the umbilical vein and only reaches the rest of the body after it has passed through its capillaries. The intense saturation of the liver with spirochaetes, with the accompanying fine fibrosis and the development of miliary gummata, is the form of congenital syphilitic disease of the liver which is familiar to everybody. Less well recognised are the later or more chronic manifestations, for, as Dr. Rao observes, it may be impossible to demonstrate spirochaetes in them. Often enough the syphilitic nature of the lesions can only be presumed from the clinical history or the recognition of more characteristic changes elsewhere in the body. Among these more obscure hepatic lesions Dr. Rao includes chronic periportal pylephlebitis, pericholangitis, and endophlebitis of the hepatic vein, illustrating his thesis by descriptions of interesting cases occurring in the autopsy practice of the King George Hospital of Vizagapatam. A number of helpful photomicrographs are included and the value of the article is enhanced by a very complete bibliography.

USE OF MENTHOL IN CHILDHOOD

IN an annotation on the treatment of the common cold in France, published a fortnight ago, we mentioned the apparent unpopularity of menthol as a remedy. In adults toxic symptoms due to the use of this drug must be extremely rare, but as long ago as 1912, it seems, R. Leroux wrote in no uncertain terms of the danger of its use in childhood, and particularly in infancy, even when given by intranasal instillation in vaseline. He thought that it was liable to produce reflex inhibition of both respiration and cardiac action, and that its action and dangers were exactly comparable to those of chloroform anaesthesia in its early stages. It happens that Dr. Champeau has just recorded¹ severe disturbances

⁷ Barnes, B. O., Regan, J. F., and Nelson, W. O.: *Jour. Amer. Med. Assoc.*, 1933, ci., 926; Nelson, W. O., and Overholzer, M. D.: *Proc. Soc. Exp. Biol. Med.*, 1934, xxxii., 150.

⁸ Shumacker, H. B., Jun., and Lamont, A.: *Proc. Soc. Exp. Biol. Med.*, 1935, xxxii., 1568.

⁹ Engel, P.: *Klin. Woch.*, 1934, xiii., 1540.

¹⁰ Campbell, M., Wolfe, J. M., and Phelps, D.: *Proc. Soc. Exp. Biol. Med.*, 1934, xxxii., 1205.

¹¹ *The Law Relating to Carriers' Licenses under the Road and Rail Traffic Act, 1933.* By Eric F. M. Maxwell, of the Inner Temple and Northern Circuit, Barrister-at-Law. London: Sweet and Maxwell Ltd. 1936. Pp. 330. 15s.

¹ *Bull. de l'Acad. de Méd.*, 1935, cxiv., 448.

in a child $4\frac{1}{2}$ years old which he attributes to the ingestion of 6 mg. of menthol. Having previously suffered from adenoids, she was given three sweets, each containing 2 mg., at the onset of an upper respiratory infection. The menthol was in high concentration (1 in 100), since each sweet was only approximately 20 cg. in weight. An hour after the drug had been administered, the child suddenly appeared tired and asked to be put to bed; she then became very pale, with coldness of the extremities and cyanosis of the face. Respiration was spasmodic, and the pulse rapid and irregular, ceasing entirely for periods of several seconds during which the diaphragm was in spasmodic contraction; she also vomited. The crisis lasted in all about three-quarters of an hour, the condition improving after injection of camphorated oil. At Champeau's suggestion, the Medical Society of Evreux, at its general meeting last October, unanimously recommended that all menthol products should be clearly labelled as containing a drug for adult use and dangerous to children, and that the medical and pharmaceutical faculties should have their attention drawn to the danger of prescribing menthol in early life. We may note that Martindale and Westcott's "Extra Pharmacopœia" already contains a similar warning: "It is dangerous to apply an ointment containing menthol to the nostrils of infants, e.g., for treatment of catarrh,—may cause instant collapse." The same caution is applied to camphor.

THE HEALTH OF THE AIR FORCE

DURING the year 1934 the Royal Air Force maintained its good health and the incidence of disabilities fell, in fact, by more than 5 per cent. There was a total of 19,344 cases of sickness, an incidence of 632 per 1000 of strength which, compared with the periods 1928-33 and 1921-27, showed a decrease of 48 and 362 per 1000. This incidence equals that of 1932, which was the lowest since the reports began in 1920. The number of deaths of those invalided from the service and of venereal infections was each the lowest on record. The chief causes of disability were injury and venereal disease, respectively 77 and 9.9 per 1000. Of the 94 deaths, injury accounted for 58, and 24 of these were due to flying accidents. As in previous years, pulmonary tuberculosis and psychoneurosis were the commonest causes for invaliding 155 men out of the service. Disease and injury as causes of sickness bear the usual relation to one another, the former constituting 80.5 per cent. of the total. A notable decrease occurred in the number of cases due to influenza, respiratory disease and diseases of the skin. Though an epidemic of dysentery in Iraq produced a sharp rise to 156 cases, the incidence of malaria and sandfly fever fell to 373 and 283 respectively. After injury, the commonest cause of sickness was disease caused by infection, with diseases of the digestive system second on the list. The average duration of each case was 17 days. Expansion of the service has led to an increase in the routine work of the central medical establishment, and a study has been made of the effects of strain resulting from the rapid development of aircraft. During the year the results were published of research in the significance and treatment of heterophoria and in the relationship between body-build and functional efficiency,¹ when it was shown that overweight men were more capable of enduring both physical and mental strain than those under weight. In the pathological laboratories at

Halton there has been research into the aetiology of tonsillitis and droplet infections among the aircraft apprentices. A report of the possibility of yellow fever at places in the Sudan used for landing grounds by both the Air Force and the civil airways led to an investigation throughout the country. Serological tests proved that though yellow fever probably had been present in the past there was little risk of foreigners contracting the disease, and therefore there was no interference with the air services beyond quarantine examination and disinfection.

THE POPULATION PROBLEM IN INDIA

FROM a study of the growth of populations¹ Colonel C. A. Gill, I.M.S., has advanced the view that various population types can be differentiated, each representing a different stage of growth from "infancy" to "old age." The passage through these stages is dependent, he believes, on natural laws of populations which secure the progressive evolution of the human race. In general it appears from his argument that the stage of growth reached must govern the legislative and administrative action required for the needs of specific populations. In particular in British India, which Gill classified as in the "nascent" stage, any appreciable and continuous reduction of the birth-rate must, he asserts, place a check upon progressive evolution unless it is associated with a corresponding reduction of the death-rate. He therefore argues that any endeavour to popularise the use of contraceptives in that country would be a biological blunder.

From these views, outlined in our columns early this year,² Lieut.-Colonel A. J. H. Russell, Public Health Commissioner with the Government of India, and Prof. K. C. K. E. Raja, of the department of vital statistics and epidemiology of the All-India Institute of Hygiene and Public Health, dissent completely.³ Neither in vital statistical indices nor in the evidence relating to fecundity marshalled by such workers as Carr-Saunders do they find any support for Gill's theory of a decreasing urge of prolificity as a biological phenomenon when we pass from primitive to mature population types. It seems that the regulation of numbers has exercised the mind of man at all times and various means of achieving this regulation were present in primitive pastoral communities as well as in countries of modern civilisation. It is certainly difficult to see why we should be running counter to the purposes of nature by adopting contraception in preference to abortion and infanticide. If India, in particular, is to reach and maintain a higher standard of living the question of family limitation must, Russell and Raja urge, become one of increasing importance. The present picture they draw of her population is that of a community living at an extremely low standard and growing at a pace which is outstripping or threatening to outstrip its food-supply. Even if some allowance is made for a speedier development of her natural resources the attainment of higher standards of health and comfort, demand, they say, some retardation of the present rate of growth.

This conclusion can hardly be regarded as an overstatement. The position is frankly regarded as disturbing by such observers as Sir John Megaw whose opinion is quoted in this paper. "There is every reason to believe," he has said, "that the maximum increase which can be hoped for in the production

¹ Jour. of Hyg., 1934, xxxiv., 502.

² THE LANCET, 1935, i., 563.

³ Ind. Jour. Med. Res., 1935, xxiii., 545.

¹ THE LANCET, 1934, i., 1377 and 1399;

of the necessities of life will not keep pace with the growth of the population so that there is a prospect of a steady deterioration in the state of nutrition of the people." Does evolution really demand this high natality and the high mortality to which it must apparently lead? On another page of our present issue is set out Sir John Megaw's own answer to this question. In India, he says, a comprehensive food policy is needed to save that country from a relapse into barbarism. Educated Indian opinion already recognises this and he is hopeful of the success of a concerted national movement.

NEW YEAR HONOURS

THE decorations and dignities conferred by the King this New Year are few compared with those granted in last year's list of Birthday honours, which commemorated the Silver Jubilee. Of the five new knighthoods, Dr. Knuthsen's is a promotion in the Royal Victorian Order, two are given for services in India, and two go to surgeons of high distinction, Prof. Wilkie of Edinburgh, and Mr. Devine of Melbourne. Outside the straiter bounds of medicine we are glad to note that the list of new knights includes the name of Prof. Arthur Harden, F.R.S., biochemist and Nobel prizeman, while others closely associated with medical activities are Mr. Percival Hartley, D.Sc., director of the Department of Biological Standards, Mr. J. F. Marshall, director of the British Mosquito Control Institute at Hayling Island, and Miss Olga Nethersole, founder of the People's League of Health, all of whom are created C.B.E. Sir Gomer Berry, who receives a peerage, has been for many years an open-handed supporter of hospitals and the medical efforts associated with them. To these and to all whose names are set out on p. 60 we offer congratulations.

THE LITERATURE OF BLOOD TRANSFUSION

FIFTEEN years ago a bibliography of blood transfusion would have consisted of one to two hundred entries dealing chiefly with the early experiments on the technique. Since 1920 the subject has grown enormously and its ramifications are still spreading as the difficult subject of blood groups and reactions is slowly unravelled, and as the indications for transfusion increase. A bibliography of the whole field has now been compiled by Dr. E. Koenig¹ in Russia, and although this only covers the period 1900-33 the number of entries runs to 4323. It is improbable that even so it is complete, but it is comprehensive enough to be extremely valuable to everyone working on any aspect of the problem. The bibliography has been compiled by the Scientific Research Institute for Blood Transfusion in Leningrad and is published conjointly by the Institute and the *Vestnik Chirurгии*. The titles of the Russian, German, English, French, and Italian papers are printed in the original languages, and there are in addition German translations of the titles from Czech, Danish, Dutch, Estonian, Georgian, Hungarian, Japanese, Norwegian, Polish, Portuguese, Rumanian, Serbian, Spanish, Swedish, Ukrainian, and White-Russian sources. The whole subject has been divided into 22 sections and 77 subsections, the headings of the sections being printed in the first five languages mentioned. The book is therefore a model of what an international bibliography should

¹ International Bibliography on the Problems of Blood Transfusion and the Theory of Blood Groups, 1900-1933. By Dr. E. Koenig. Leningrad: Vestnik Chirurгии, 1935. Pp. 226. R.12 k.50.

be, and it is difficult to see how its plan could be improved. Its general accuracy can only be properly assessed by use, but it seems possible that the index of names could be made fuller; for example, one name which appears six times in the bibliography is only given two entries in the index. The compilation of the list is still proceeding, and a supplement will be published when sufficient material has accumulated. Suggestions will be welcomed by the Institute for Blood Transfusion in Leningrad.

THE second International Congress of Microbiology will be held in London from July 25th to August 1st under the presidency of Prof. J. C. G. Ledingham, F.R.S. The congress will have its headquarters at University College, and its meetings have been arranged under the following sections: general biology of micro-organisms (president, Prof. E. Gotschlich, Heidelberg); viruses and virus diseases in animals and plants (Prof. R. Doerr, Basle); bacteria and fungi in relation to disease in man, animals, and plants (Mr. E. J. Butler, F.R.S., London, and Prof. H. Zinsser, Boston); economic bacteriology, soil, dairying, and industrial microbiology (Prof. R. E. Buchanan, Iowa); medical, veterinary, and agricultural zoology and parasitology (Prof. E. Brumpt, Paris); serology and immunochemistry (Prof. K. Landsteiner, New York); microbiological chemistry and specific immunisation in the control of human and animal disease (Prof. W. H. Park, New York). The hon. general secretary for the congress is Dr. R. St. John Brooks, Lister Institute of Preventive Medicine, Chelsea Bridge-road, London, S.W. 1.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED
DEC. 21ST, 1935

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2522; diphtheria, 1216; enteric fever, 14; acute pneumonia (primary or influenzal), 1073; puerperal fever, 30; puerperal pyrexia, 107; cerebro-spinal fever, 17; acute poliomyelitis, 6; acute polio-encephalitis, 1; encephalitis lethargica, 10; dysentery, 48; ophthalmia neonatorum, 72. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Dec. 27th was 3590, which included: Scarlet fever, 1171; diphtheria, 1204; measles, 250; whooping-cough, 399; puerperal fever, 20 mothers (plus 15 babies); encephalitis lethargica, 280; poliomyelitis, 3. At St. Margaret's Hospital there were 14 babies (plus 2 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox, 4 (1) from enteric fever, 39 (4) from measles, 8 (0) from scarlet fever, 20 (6) from whooping-cough, 55 (9) from diphtheria, 39 (9) from diarrhoea and enteritis under two years, and 67 (8) from influenza. The figures in parentheses are those for London itself.

Portsmouth, Manchester, and Grimsby each had 1 death from enteric fever. Liverpool reported 12 deaths from measles, Manchester 6, Bootle 3, Blackburn, St. Helens, and Stockton-on-Tees each 2. Liverpool also reported 5 deaths from whooping-cough. The deaths from diphtheria were reported from 30 great towns; 5 from Birmingham, 4 from Huddersfield, 3 each from Bradford and Sunderland. The mortality from influenza is scattered over 34 great towns, Manchester and Birmingham each reporting 6, Liverpool 5, Southampton 3, no other great town more than 2.

The number of stillbirths notified during the week was 254 (corresponding to a rate of 42 per 1000 total births), including 49 in London.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXXXIII

PROGNOSIS IN TRIGEMINAL TIC

CHRONIC paroxysmal neuralgia of the trigeminal nerve, or trigeminal tic, may be said never to be cured by drugs, or to disappear spontaneously. It may start gradually, with shoots like toothache, or it may leap suddenly into consciousness with a shattering explosion of pain in the face. Once started, the pain is bound to recur again and again, though there may be in some cases intervals of years of complete freedom in the earlier stages. Gradually the attacks become more frequent, and usually more severe as the years pass, till ultimately scarcely a day passes without numerous stabs of almost intolerable agony in jaw, tongue, nose, and sometimes eye and forehead.

I have seen two women who had suffered for over fifty years, one having commenced the paroxysms at the early age of twelve. Often, but not always, as time goes on the neuralgia may spread from the original site in one or other jaw, or possibly the eyebrow, until it involves all three divisions of the trigeminal area on one side. Sometimes the pain remains located in upper or lower jaw alone, but invariably if the pain starts in the first division, in eyebrow and forehead to top of head, the neuralgia ultimately spreads downwards to involve the nose and upper lip and cheek, spreading from the first into the second division, though several years may elapse before this takes place.

Inheritance of the disease is not very rare, the neuralgia almost invariably appearing at a younger age in the second generation, and again younger in the third. I have had two patients of a family in which nine members suffered, three in each of three generations, the disease appearing at the age of 16 in two sisters, and at 20 in their brother, in the third generation.

TREATMENT BY ALCOHOL INJECTION

The easiest form to treat successfully is third division tic, the pain affecting the lower jaw only and perhaps the same side of the tongue. A properly placed alcohol injection into the nerve at its exit from the foramen ovale will instantly numb the lower jaw, chin, and lip, and half the tongue, so that the tongue movements become free and easy, and no longer cause painful spasms, and eating and swallowing are immediately possible without causing any of the distress previously felt. Owing to the numbness of the left gum and inside of cheek and the half of the tongue, it is preferable for the patient to eat on the other side of the mouth; the weakness of the biting and chewing muscles on the affected side, produced by the involvement of the motor root in the alcohol injection, tends to upset what dentists call the "bite" and the alignment of the dentures. The motor fibres usually recover with 3 months, though the anaesthesia and freedom from pain may be measured by years. I have seen numerous cases of five years' standing and upwards with complete freedom after injection of the third division only, and I have seen recurrence after 13 years and 15 years, while another patient is still quite free after 26½ years.

The reason for the long periods of relief after third division injection, as compared with the results after second division injection, is that when the alcohol is injected into the nerve at the foramen ovale, a cer-

tain amount often enters the Gasserian ganglion and destroys a number of nerve-cells in its outer part, so that partial numbness and light anaesthesia is apt to be permanent, sufficient in certain individuals to keep the neuralgia at bay almost indefinitely. When the second division is injected, at or in front of the foramen rotundum, no alcohol will reach the Gasserian ganglion, and though complete and total anaesthesia of the cheek, jaw, and palate on that side may result, with immediate relief of the neuralgia, yet new nerve-fibres grow down from the ganglion cells fairly rapidly, and in twelve months or less sensation may be practically normal again, and thus no obstacle remains to the passage upwards of the painful impulses from the periphery.

ROOT RESECTION OR GANGLION INJECTION

Since recurrence of the neuralgia in second division cases is usual after a year or two, the question of either root resection or ganglion injection must be considered. If the second division alone is involved, then injection at the foramen rotundum should always be done as the preliminary treatment, for two reasons: first, because it is possible in a few cases to obtain relief lasting many years; and secondly, to accustom the patient to the permanent numbness that would result from the ganglion injection or root resection. A small proportion of patients object intensely to the numbness, and the preliminary injection will be a test as to whether they would prefer to endure the neuralgia, if it returns, or to put up with permanent numbness as the price of a cure. If the first division is involved together with the second, the pain shooting up the forehead to the vertex, and perhaps in the eyeball itself, then it will probably be useless to inject the second division only, and it will be necessary to deal with the ganglion at once, or else have the sensory root resected. It is possible in these cases to inject the inner two-thirds of the ganglion only, leaving normal sensation on the unaffected lower jaw and tongue, which is a considerable comfort to the patient. Though the motor root may be paralysed at first, it nearly always recovers within about three months. By the open method of operation for root resection, it is now possible to save the motor root in most cases, and from the method of fractional root resection, leaving uncut a small bundle of fibres on the inner side of the root, incomplete anaesthesia results, especially of the ophthalmic branch, so that the risk of keratitis is much diminished.

CARE OF THE CORNEA: KERATITIS

The care of the cornea is very important for the first few weeks after total root resection or ganglion injection. If, however, the eye is shaded from the first by a close-fitting curved straw-plait shade, no lint or wool being used under the shade, and the conjunctival sac washed out twice daily with weak (1 in 7) boracic lotion, then in almost all cases the eye remains healthy, and the shade can be gradually discarded after five or six weeks. If, through carelessness, or for other reasons, such as the presence of facial palsy, the cornea is insufficiently protected, or should there be a pre-existing conjunctivitis or trachoma, then keratitis is much more likely to supervene, and it will be necessary to close the lids by tarsorrhaphy, and not reopen them for several months. Hence, before deciding on a total root

resection or ganglion injection, it is important to examine the vision of the two eyes; if the eye on the side of the neuralgia is the only sound eye, the patient's difficulties are much increased by having the eye closed, even for a few weeks, and should serious keratitis develop, the loss of vision will be tragic. Fortunately, with proper care of the eye from the moment of completion of the injection, or operation, keratitis should never develop, unless facial palsy or conjunctivitis are present. Facial palsy is not a rare complication of root resection; it is associated with traction or other interference with the Vidian nerve as it runs beneath the ganglion.

OTHER COMPLICATIONS

With a ganglion injection, slowly and properly performed, facial palsy is very rarely seen, though occasionally vertigo, and nystagmus to the opposite side, owing to leakage of alcohol backwards to the internal auditory meatus, may give trouble for periods from a few minutes to an hour or two. Herpes on the upper lip and side of nose is common, both after injection of the ganglion and root resection, but it gives no real trouble and leaves no scars or post-herpetic pain. It is not a true zoster, and its serum reactions are those of herpes febrilis. Temporary diplopia is also met with occasionally, both after injection and root resection.

With total anaesthesia of the third division, there is a liability for the patient to bite the lower lip, inside of cheek, or even the tongue, during the first three days. This tendency is attributable to the strange feeling of the numb parts; but re-education is speedy, and no trouble of this kind occurs after the first few days, during which soft food only is advisable.

In a small proportion of cases, cure of the paroxysmal neuralgia, whether by injection or root

resection, may be followed by persistent burning sensations in cheek and eye; shooting pains may even be complained of, or a sensation of discomfort or coldness in the eye. Mostly these sensations appear to be of a psycho-neurotic nature. They do not appear at once, but a month or two after an operation which appears at first to have been the usual success. Possibly sympathetic nervous disturbance is a factor in some cases, and I have had one case in a young woman in whom stellate ganglionectomy relieved the symptoms.

BILATERAL TIC

In 4 to 5 per cent. of the cases similar neuralgic pains attack the other side; occasionally from the commencement both sides may suffer, though the pain on one side is usually much more severe at first; ultimately it is probably equally severe on the two sides, sometimes alternating. Women suffer from trigeminal tic much more frequently than men, perhaps twice as often, and when the disease is bilateral, the proportion of women to men is, as might be expected, doubled, about four to one.

Bilateral injection of the foramen ovale, if the two injections are performed within three months of each other, will cause jaw drop, and soft food will be necessary. Even though the anaesthesia remains total and permanent, the motor roots usually recover in a few months, as their trophic-cell nuclei are in the pons. If root resection is done, the motor root can usually be saved, but, if it is cut, it never regenerates. Bilateral facial anaesthesia does not worry the patients much, though the processes of eating may require practice with a mirror.

WILFRED HARRIS, M.D., F.R.C.P.

Senior Physician, Hospital for Epilepsy and Paralysis, Maida Vale; Consulting Physician, St. Mary's Hospital, London.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Lt.-Comdr. T. L. Cleave to *President* for course.

Surg. Lts. J. M. Fitzpatrick to *Enterprise*; N. C. Hepburn, W. F. Viret, and F. H. Lamb to *Pembroke* for R.N.B.; H. G. Silvester and D. Simpson to *Victory* for R.N.B.; A. E. Ginn, D. Shute, and J. Lees to *Drake* for R.N.B.; and J. Carlton to *Hood*.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt. P. C. Lewis to R.M. Barracks, Plymouth.
W. S. Walton entered as Proby. Surg. Lt.

ARMY MEDICAL SERVICES

Col. J. P. Helliwell, C.B.E., late A.D. Corps, to be Maj.-Gen.

Lt.-Col. J. V. M. Byrne, from A. D. Corps, to be Col.

Maj.-Gen. J. P. Helliwell, C.B.E., from Asst. Dir.-Gen. Army Med. Servs. (for the Dental Serv.), to be Dir. Army. Dental Serv.

ROYAL ARMY MEDICAL CORPS

ARMY DENTAL CORPS

The undermentioned Majs. to be Lt.-Cols. :—
A. B. Austin, F. H. W. Beer, J. P. Duguid, A. Gibson, and R. J. Condie.

The undermentioned Capts. to be Majs. :—
W. Wormington, J. B. Cowie, M.M., F. H. R. Davey, F. F. Anslow, W. J. R. E. Edwards, F. S. S. Whiter, D. C. Blyth, F. G. Arnold, R. H. N. Osmond, W. G. Bradbeer, and B. J. Swyer.

The undermentioned Lts. to be Capts. :—
H. C. Dobbie, G. M. Sinclair, H. W. South, C. E. Howell, K. H. Coulton, J. E. C. Robinson, and R. H. Green.

ROYAL AIR FORCE

The undermentioned promotions are made with effect from Jan. 1st, 1936 :—

Air Commodore to be Air Vice-Marshal : Alfred William Iredell, K.H.P.

Wing Commanders to be Group Captains : Gerald Struan Marshall, O.B.E., and Raymond William Ryan.

Squadron Leaders to be Wing Commanders : James Henry Hope Maxwell, William Edward Barnes, James Daly Leahy, M.C., Edward Cyril Knowles Henry Foreman, and William John Greaves Walker.

Flight Lieutenant Leonard Freeman is promoted to the rank of Squadron Leader.

Dental Branch.—Flying Officer William Vernon Anthony Denney, L.D.S., is promoted to the rank of Flight Lieutenant.

The undermentioned are granted short service commissions as Flying Officers for three years on the active list :—

C. F. R. Briggs, H. D. Conway, L. M. Crooks, W. J. Fowler, I. K. Mackenzie, H. C. de B. Milne, D. J. Sheehan, and R. F. Wynroe.

Dental Branch.—R. M. Brown and W. E. Nelson are granted non-permanent commissions as Flying Officers for three years on the active list.

INDIAN MEDICAL SERVICE

Lt.-Cols. P. S. Mills and D. C. V. Fitzgerald, M.C., to be Cols.

The King has approved the award of the Distinguished Service Order for gallant and distinguished service in action in connexion with the recent Mohmand operations, North West Frontier of India 1935, to Capt. F. J. Doherty, M.B., I.M.S., attached 5th Battalion (Queen Victoria's Own Corps of Guides), 12th Frontier Force Regiment, Indian Army.

SPECIAL ARTICLES

MEDICAL EDUCATION AND MEDICAL RESEARCH*

By W. W. C. TOPLEY, M.D. Camb., F.R.C.P. Lond.,
F.R.S.

PROFESSOR OF BACTERIOLOGY AND IMMUNOLOGY IN THE
UNIVERSITY OF LONDON AT THE LONDON SCHOOL OF
HYGIENE AND TROPICAL MEDICINE

We should all, I fancy, be hard put to it, if asked to explain what medical research means. For our present purpose we may take it as a convenient label covering a multitude of interrelated activities, all concerned, immediately or remotely, and sometimes very remotely, with the study of disease in man. Proceeding from this *ad hoc* definition, we may consider how our present medical curriculum fits people to work in different parts of this very extensive field.

Before doing so I should like to make two things clear. Firstly I am, in the main, thinking in terms of the whole-time research worker—the man who intends to devote himself to research, or to research and teaching, as opposed to practice. Secondly, I am airing personal opinions with which I have no reason to suppose that anyone would agree.

Words are tricky things, and I may easily fail to convey the meaning I intend, or to put the emphasis in the right place; so that I propose to start at the end, and state my conclusions quite clearly before I give my reasons for them. The theses that I am attempting to maintain are these:

(1) That the present medical curriculum, in its usual form and including all such modifications of it as are in sight, however adequate it may be for the purposes for which it was designed, fails badly as a method of providing recruits for medical research, except, perhaps, in the strictly clinical field.

(2) That the reason why the medical curriculum fails, from the research point of view, is that, except in the strictly clinical field, the success of a research worker will depend more on his knowledge of the basic sciences on which medicine is founded than on his detailed knowledge of practical medicine or surgery in the clinical sense.

(3) That medical research, at least on its laboratory side, is not an activity that can profitably be adopted as an alternative to practice at some late stage of a student's career, but must be consciously prepared for, from his earlier university days onward.

The Background Needed for Research in Various Fields

In giving my reasons for these statements, it will be convenient to start by taking samples of different kinds of research workers, and considering the things they must know in order that they may work effectively.

CLINICAL RESEARCH

To preserve a proper sequence I am forced to start with a subject on which I can speak with no authority at all—medical research in what is, perhaps, its strictest sense, the acquirement of new knowledge in regard to disease by observations carried out at the bedside. The proper name for this is clearly clinical research. Speaking as an outsider, it has always seemed to me that clinical research, in the true sense

of that term, demands a combination of qualities, and a breadth of knowledge, of a very exceptional kind. It may, I think, be laid down as an axiom that no one is likely to make any real advance in our knowledge of disease unless he has the scientific outlook—science and pseudo-science are poles apart. Pseudo-science is even harder to define than medical research; but since it is a very horrid and insidious intellectual infection, to which we medicos are freely and frequently exposed, it may be worth noting some of its signs and symptoms. One of the worst is the uncritical application to practical medicine of procedures derived from physiological or pathological principles under conditions where there is no evidence that those particular principles are applicable. I suppose that the exploitation of hormones, or of bacterial vaccines, can supply some of the most fearsome examples, just as, when used as they should be, these reagents afford some of the most striking instances of the scientific cure or prevention of disease. Another symptom of medical pseudo-science is a confusion of apparatus with method, a belief, for instance, that things done in a laboratory are necessarily more scientific than things done outside it. In the absence of a clear grasp by a clinical worker of the implications of laboratory tests, or of a close and personal liaison between workers in the laboratory and in the ward, this form of the disease can be very harmful. Perhaps the most insidious form in which pseudo-science can attack us is that of rationalisation—the tendency we all have to make up reasons as to why we do things, or why things happen, without submitting our reasoning to the tests of repeated observation and experiment that science dictates. If we give way to this, if we mistake a guess for a working hypothesis, and a working hypothesis for a well-established theory, then we are lost.

But the scientific outlook—the determination not to go beyond our evidence and to test each link in our chain of reasoning—is much easier to maintain when the things we are thinking about do not matter very much to ourselves or anybody else. The more they matter, in this emotional sense, the harder it is to regard them as data for consideration, or problems for investigation, rather than as practical problems that have to be tackled somehow or other, and as quickly as possible. Now clinical medicine does matter very much, and I should say that the purely scientific outlook is, for the ordinary person, entirely impossible. If it were possible it would, I think, defeat itself; because the subject of clinical research is not sickness, but the sick person, and a lack of emotional understanding will render the clinician blind to half his problem. So we must make many demands of our clinical research worker. He must be able to separate from the mass of data with which his experience presents him those that can be dealt with on strictly scientific lines. These will, of course, often include the emotional reactions of the patient; but the clinician, in his capacity of investigator, must try to regard them as though they were figures in a sum, or the results of titrations, or steps in an argument. But also, and at the same time, he must do the best he can for his patient, and this means that he must often use measures which, as a scientist, he would regard as based on a very doubtful foundation of ascertained fact. The thing can be done. It has been done, and done supremely well by some of the great clinicians. It is of the utmost importance

* Based on an address delivered to the Cambridge University Medical Society on Oct. 23rd, 1935.

to medical science that it should continue to be done well in the future. But it demands a clarity and adaptability of mind of a very high order. I think, also, though here I speak with the greatest diffidence, that this field of work in the future is going to make even greater demands than it did in the past, when so much of the purely clinical territory remained unmapped. I should guess that it will not be easy for the clinical investigator of the future to go very far unless he is a master of some special technique which, in its essence, is non-clinical, though it is applicable to clinical problems. Or, perhaps, it would be truer to say that the man who relies on clinical methods alone—clinical in the restricted sense—will find his field of activity greatly restricted, while the man who has mastered some ancillary technique, chemical, or physiological, or pathological as the case may be, in addition to his clinical training, will find problems in plenty waiting for solution. I do not, of course, mean that he must be a chemist, or a physiologist, in the broad sense, as well as a clinician—that, I suspect, would be an impossibility. But, if he is to work in any of those borderlands that call so urgently for exploration, he should be expert in that limited non-clinical field which he hopes to apply in his clinical studies. Of one thing I feel very sure, clinical research in the true sense will never consist in engaging other people to make a host of tests and examinations, using techniques which one has not mastered oneself, and then trying to add the results together. It is, of course, obvious that there are medical problems that demand for their solution the application of methods drawn from several different branches of science. But the proper method of approach to such problems is the method of team-work—a question that I hope to discuss later. Those who desire a more detailed and authoritative account of clinical research than I can offer should refer to the Iluxley lecture given by Sir Thomas Lewis.¹

LABORATORY WORK IN HOSPITALS

Having ventured over a frontier which, perhaps, I should never have transgressed, I can turn to what is, to me, more familiar ground. The laboratory worker, to use a useful generic label for the multitude of scientific activities that are ancillary to medicine, has fewer demands made upon him than has the research worker in the wards. He is not, in general, responsible for the care, or treatment, of the sick person, and this makes it much easier for him to view his facts dispassionately, and to treat them as data which gain significance only in so far as they add together to form an ordered whole on which at least a tentative conclusion can justifiably be based. But it is clear that the term "laboratory worker" is almost as vague and elastic as "medical research." There are those who work in the laboratories attached to our great teaching hospitals, and even among these there are significant divisions. Of clinical diagnostic pathology I do not wish to say much. A great part of it, in my personal view, belongs to the domain of clinical medicine rather than pathology; for I do not see why the clinician's technical armoury should be limited to the instruments and methods that past generations happened to employ. The clinical pathologist must clearly be at least a competent clinician as well as a laboratory worker—competent in the sense of having an intimate knowledge of disease as it occurs in man, and an ability to weigh clinical evidence, though not

necessarily the ability to obtain that evidence for himself.

When we view pathology—including under that term bacteriology and chemical pathology—from the angle of the hospital medical school rather than from that of the ward, the connexion with the sick person, as such, becomes more remote. We are now hardly concerned at all with the fate of Mr. A. or Mrs. B., not at all, in our professional capacity, with their happiness or well-being apart from the particular disease from which they are suffering. Indeed, we never meet them as human beings. In so far as our humanitarian aims and aspirations are concerned we shall not be attempting to cure them of cancer, or tuberculosis, or any other malady, but we shall hope that, through our own efforts and those of the workers who follow us, the time will come when no Mr. A. or Mrs. B. need die of these particular diseases. We shall realise, moreover, that the more we can put the present Mr. A. and Mrs. B. out of our minds, and concentrate on the disease as apart from the individual, the more likely we are to contribute something at least to the solution of our more general problem. Inasmuch, however, as we are still largely concerned with disease in man, we shall need some clinical background, though not so much as the clinical pathologist requires. But, if our requirements decrease in terms of clinical experience, they increase in terms of the basic sciences. More and more is it becoming necessary for the research worker in pathology or bacteriology to possess a sound working knowledge of organic and physical chemistry. Without it, his activities will be very seriously limited.

ACADEMIC MEDICAL WORK

And now we pass to those laboratory workers whose spheres of activity lie in universities or research institutes, instead of in hospitals. They form a continuous series that defies arbitrary division or classification. They range from university departments of pathology, through the departments of physiology, of psychology, of pharmacology, of biochemistry, of biology, of chemistry, of physics, of mathematical statistics, and so on, their immediate relation to disease growing more and more remote, and the number of their workers who are in any way concerned with medical problems growing proportionately fewer and fewer. But remoteness from the centre does not necessarily denote inactivity or unimportance. Sometimes it coincides with a locus of particularly active growth. It does not seem to me unlikely that many of the major advances in medicine will come in the future from branches of science that have no immediate connexion with the prevention or cure of disease. It is a fairly safe guess, because that is the way in which all applied sciences have advanced; and medicine has at least one example it can never forget—the work and life of Louis Pasteur.

It should, I think, be emphasised that there is a significant change in the method of approach as we pass from clinical medicine, through pathology, physiology, and biochemistry to the remoter ancillary sciences—ancillary so far as medicine is concerned. The clinician's problems are inexorably posed for him. He has considerable freedom of selection among them, but he cannot often adapt his problem to his technique, he must try to develop his technique to cope with his problem, and even when this technique is very imperfect he must do the best he can with it. The pathologist again has many of his

¹THE LANCET, 1935, I., 723.

problems set for him, but his choice among them is freer. There is less urgency in his work. He can neglect altogether those problems that seem to him to offer no hope of solution. He can make free use of animal experiment—indeed, pathology is following physiology in becoming more and more an experimental science—and he can isolate his data and phenomena far more than the clinician can, concentrating, if he chooses, on the study of one particular factor among the many that are involved in any of the manifestations of disease.

When we pass from pathology to physiology—if, in truth, we do pass any frontier beyond a convenient difference in academic labelling—we meet with a further decrease in the part played by the observation of phenomena as nature presents them to us, and a corresponding increase in the part played by controlled experiment. With this change there comes an added freedom to select problems in relation to available knowledge and technique. I need not enlarge on the enormous advantage of the introduction of new technical methods into physiology, or on the advances that have followed the adaptation of chemical or physical methods in the solution of physiological problems. The point to note is that the physiologist, when considering any problem, is free to think mainly in terms of technique. If he can devise a method of attack that offers reasonable hope of yielding a significant answer, he will be tempted to proceed. If he cannot, he will probably select some other problem, rather than work with unsatisfactory tools. I suppose that my physiological colleagues would agree with me that Claude Bernard's words remain as true to-day as they were when written 70 years ago:—

“The prudent and reasonable course at the present moment is to explain all that part of disease which can be explained by physiology, and to leave that part which we cannot so explain to be explained by the future progress of biological science.”

Claude Bernard, it may be noted, steadfastly refused to recognise any division between physiology and pathology, beyond that incidental to an arbitrary system of labelling, and I think I may best express his outlook on the relation of experimental science to clinical medicine by a further quotation, which occurs in the same passage of the same book.

“But if, instead of this, some delusive approach of physiology gives rise to the ambition to explain prematurely at one step the whole of the disease, then one loses sight of the patient, one gets a wrong idea of the disease, and, by a false application of physiology, experimental medicine is hindered instead of being assisted in its progress.”

That, also, is as true to-day as it ever was.

Is it necessary for the physiologist, or the experimental pathologist, to have any detailed acquaintance with practical clinical medicine? For the moment I would merely note that the necessity is clearly much less than in the case of the clinical pathologist or the morbid anatomist. When we come to the biochemist, the experimental biologist, the chemist without the bio-, and the physicist, we are on rather different ground. In none of these instances is there any reason beyond inclination for the research worker to concern himself with medical problems in any shape or form. If he does so, it will be, or should be, because the knowledge and technique at his disposal are of a kind that are ripe for application to some problem of scientific medicine in its broadest sense. One implication is, I think, obvious. In all these fields the value of a man's contributions to medical research will depend mainly on his ability

as a chemist or a physicist. How much medicine must he know, or how much biology? It will be more convenient to consider that question a little later.

I have not, I am sure, exhausted the field of medical research in these brief glances at different parts of it. I have not, for instance, discussed the important subject of psychology, nor the study of the diseases of herds that is the domain of the epidemiologist. But it will, I think, be apparent that the territory covered is of very wide extent; and we should, I take it, all agree that any wise policy that takes the long view must aim at keeping the whole of it healthy, and active, and coördinated.

The Modern Team

This brings us naturally to the question of team-work; and successful team-work is, I believe, the only method that will enable us to advance rapidly and surely. The range of knowledge required for the solution of most of the problems that face us is, I think, beyond the command of any one man, or of any group of men trained in the same technique. The teams will vary in their character and composition according to the particular field in which they are working. At one end of the scale the clinically trained members of the team will be the dominant partners, doing most of the work and seeking help from their non-clinical colleagues. At the other end of the scale there will be teams with no clinically trained members at all. In between there will be every kind of gradation according to the knowledge and technique that each problem demands.

I do not want to give an impression that, in regard to this question of team-work, I am merely painting a picture of what may be in years to come. I am giving a picture of things as they are to-day. In seeking illustrations it is easier for me to take them from the ground I know best—the middle ground where pathology and the basic sciences are both involved, but clinical medicine does not come prominently into the picture.

The two great institutes of medical research in this country—research as apart from teaching—are the National Institute for Medical Research at Hampstead, and the Lister Institute of Preventive Medicine at Chelsea. If you look at the reports of these institutes for last year, 1934, and glance through the degrees and qualifications of the scientific staff and workers, you will note the following figures.

At the National Institute for Medical Research there were 36 workers: of these 13 had a medical degree or diploma, 3 had a veterinary diploma, and 20 had a science degree but no medical qualification.

At the Lister Institute there were 27 workers: of these, 11 had a medical degree, while 16 had not.

Taking them together there were 24 medicals as compared with 39 non-medicals.

The non-medical workers were, in fact, about half as many again as those with a medical qualification. And it should be noted that the non-medicals—mainly chemists and biochemists, with some biologists and a few physicists—were not in any subordinate position, assisting those who happened to be medically qualified with the problems on which the latter were engaged. They included, and include, heads of divisions and departments; and they number among them some of the most distinguished scientific workers in our common field. That is the sort of world into which those of you who decide to devote yourselves to medical research on its non-clinical side, are going; though in university

departments, where the teaching of medical students is combined with research, you will still find a considerable predominance of medically qualified workers.

I have extolled the virtues of team-work; and I have given you my reasons for believing that, for most of us, there is no alternative. But no human system is all virtue and no vice, and teams have their dangers as well as their advantages. The teams I believe in myself are loose, elastic things, easily and naturally modified as need arises, not rigid and ordered, with a set hierarchy of workers. Most members of a team should, I think, be tackling particular problems of their own, as well as those on which the team is engaged, though there may well be a call for whole-time work over a relatively limited period. In any case, I am very sure of one thing, that successful team-work depends on mutual understanding; and mutual understanding, like most things worth having, demands some effort. In this case the understanding that is most required is an understanding of other peoples' technique, including in that term the way their minds work as well as the methods they employ. I do not mean, of course, a knowledge of their methods that would enable one to do their work oneself, but a sufficient acquaintance with the technical processes they employ, and the kind of things they do with them, to enable one to see a problem, if only dimly, through their eyes. To this kindergarten kind of knowledge over the general field there should, I think, be added a deeper knowledge of some limited part of it that lies adjacent to one's own special sphere of activity. We must, I fear, be specialists, but the more overlapping we can manage the better for us all.

A relatively detailed knowledge of some subject ancillary to one's own can be obtained only as a part of a planned educational syllabus; but the more general knowledge can most easily and pleasantly be grafted on a rudimentary training in the basic sciences by personal contacts and informal talk and discussion. These arise naturally among the workers in any research institute, or university department; but they come more easily, and tend to be much more fruitful, if the habit is acquired early in life. You will be missing a great part of what a university has to give if you do not take every available opportunity of discussing scientific problems with your non-medical fellows, whether, at the start, you know anything about those problems or not.

What Kind of Curriculum

And now we may turn to the strictly educational side of our subject, and inquire what kind of curriculum is needed to fit a man to work in the wide and varied field that we have been describing.

THE TIME LIMITS OF CAPACITY FOR LEARNING

Here, again, I must start my argument by raising a question that I am ill-equipped to answer. I gather, from the reports of this year's meeting of the British Association at Norwich, that the capacity for learning does not cease as soon as we had supposed, and that even for the fifty-or-thereabouts there is some hope left. But I gather also that the tests applied were largely memory tests, and the learning of languages. So far as scientific knowledge is concerned, I am inclined to think that, for most of us at least, there is little hope of acquiring facility in a new branch of science after the later twenties. I do not mean that one could not do it if it were possible to drop all other work and devote oneself wholly, for several consecutive years, to learning

the new technique, and the facts and arguments derived from it. My feeling is that real knowledge of a science is so much the result of an integration of thought and action that the subject has to be lived with for several years at least before the necessary background can be attained and the new habits of thought acquired. I doubt, for instance, whether any ordinary man can gain a working knowledge of chemistry, or physics, in his spare time, after he has completed his formal education. I know, at least, that my own attempts to gain such knowledge have been ignominious failures.

If I am right in this, and if we accept the not-illiberal view that the average man cannot devote more than six years or so to his whole-time education, counting from the commencement of his university career, then we have those six years to allocate and no more. The research worker will, of course, go on learning all his life, indeed, his learning in this sense will hardly have commenced by the time that his six years are over; but he will be building on foundations that have been fixed during his student years, and he will not usually be able to acquire new, or different, ones.

It is, then, quite useless to plan our curriculum for the medical research worker as though his mind were a limitless receptacle, into which one could pour a large volume of a standard mixture of educational ingredients, leaving room for the addition of more detailed and specialised knowledge of the basic sciences, as and when required. By the time his six years are over he will be an embryo clinician, or physiologist, or chemist, or physicist, or so on. He will be one of these things, not all of them. He may, it is true, have developed along a line that winds across one of these arbitrary frontiers; but if, for instance, he has grafted a general knowledge of physiology on to a basic foundation of chemistry, the lines of his future development will be no less clearly marked.

The Merits and Demerits of Vocational Medical Training

Now it is surely clear that the medical curriculum, as we know it to-day, cannot possibly cope with the educational problem that presents itself. It was never meant to. It was designed, and rightly designed, as a vocational training for men and women who desire to practise medicine, to undertake certain duties to the individual and to the State, and to enjoy the privileges conferred by a registrable qualification. To obtain this qualification, by all but a very few of the available avenues, takes practically the whole of the six years that we have allowed for whole-time study. Let us take the thing as it stands, and see how it meets, or fails to meet, the requirements of the different classes of research workers that we have referred to.

FOR THE CLINICAL INVESTIGATOR

As regards the clinical investigator I have little to say, because I do not know. I should guess, as I have said, that he will gain very greatly by having carried some preclinical scientific subject well beyond the stage prescribed by the ordinary medical curriculum. He will gain in two ways. He will have acquired a knowledge and technique that he can develop and apply in later years, and, what is probably more important, he will have studied some subject sufficiently deeply to have approached the critical stage, and to have gained some insight into scientific method. He will thus attack his clinical

studies with a certain ingrained scepticism, a habit, more or less developed, of sifting evidence, that will enable him to make better use of his years in the wards.

Is this all that is required? I should not venture on an answer; but I may quote from the address by Sir Thomas Lewis to which I have already referred. He says:

"... there is room for a university degree in medical science, which should not include medicine, surgery, or other branch of medical practice as such, but should centre upon disease, as this is studied in human beings; and this degree should be intended to mark those contemplating an academic career."

He is speaking here of a degree in scientific clinical medicine grafted on a modified curriculum that has led to a registrable qualification; and, clearly, a licence to practise is essential for the man who wants to become a clinical investigator. I would ask you, however, to remember his suggestion, which seems to me an eminently wise one, in view of a possible extension of it which I propose to discuss later.

FOR THE PATHOLOGIST AND BACTERIOLOGIST

In regard to the pathologist or the bacteriologist, it is, as I have already said, my firm conviction that he will be at a serious disadvantage if he has not obtained a firm grip on some experimental science before he studies clinical medicine. I suffer from that disadvantage myself and I know what it means. It may be urged that a man does not, in fact, make up his mind that he wants to become a pathologist until he has completed, or almost completed, his medical education. But I fear that in the majority of cases he will then have made up his mind too late, unless he is prepared to spend a year or two learning what he could have learned more easily at an earlier stage in his career. Is it essential that every pathologist in the future should hold a medical qualification? Is it really necessary that he should devote three years out of his precious six to attaining those multitudinous items of knowledge and technique that the General Medical Council and the various licensing bodies demand from those who are going to treat sick men and women? At present there is no escape; and it will, I should guess, always be wise for those who propose to study pathology in close contact with the ward to go through the same educational mill as their clinical colleagues. For the rest of us, whose work lies wholly or almost wholly in the laboratory, I am not so sure. It is true that one tends to undervalue what one has and to yearn for the unobtainable, but I know that I personally would gladly sacrifice much that I remember vaguely from my hospital days for a working knowledge of chemistry.

I believe that the best solution would probably be for some academic pathologists to take a full medical curriculum, while others followed the routes that I am going to suggest as possible alternatives. The research worker is seldom isolated—it is never healthy that he should be—and among groups working in research institutes or university departments it would be all to the good that, even among those who are all labelled pathologists, different workers should have a rather different background. But there must be no differentiation in regard to status or opportunity. By whatever road a man travels all posts, including the highest, must be open to him. At the present time the man who enters the pathological or bacteriological field, even on its academic side, without a medical qualification will

find many posts closed to him; and this is a risk that few can afford to take.

FOR THE PHYSIOLOGIST AND BIOCHEMIST

As for the physiologist, those whom I have known were marked as physiologists before they approached a hospital ward, and were quite deliberately taking a medical degree as a preliminary to returning to the work of their choice. We know from example that three years in the wards, with a medical qualification at the end of it, is not an essential preliminary to the highest achievement in the physiological field. Is it, on the average, an advantage? I cannot tell. But I am sure that such advantage as there is could be purchased much more cheaply; and an educational waste in one's active learning years is not to be regarded lightly.

The biochemist, in so far as he is concerned with medical problems, I should class with the physiologist, and here again I would note that some of those whose work has contributed most notably to medical science possess no medical degree.

FOR THE CHEMIST AND PHYSICIST

And the others, the chemists without the bio-, the physicists and so on. No one would seriously suggest that they should be forced to take a medical qualification. Their training in their own subjects will take them four years or more before they reach a standard that will enable them to make use of their knowledge in the field of medical research. How are we to provide for them? For many, of course, no provision is required. They will pursue their own careers, lending occasional assistance in our problems when these have reached a stage at which they have become purely chemical, or physical, as the case may be. Medical science can never make provision within its own borders for all its needs. We shall always be asking for help from our senior colleagues in related branches of science. But it is quite clearly desirable that some of those who have mastered the technique and conceptions of one or other of the basic sciences should definitely enter the medical field and make a career for themselves within it. The men we want will not, and I do not think they should, enter this field in any position of permanent dependence on their medical colleagues; but if they have no knowledge of physiology and pathology they can hardly escape that position. Moreover, I do not myself believe that, without that knowledge, they will be in a position to grasp the fundamentals of the problems which their basic training would enable them to attack.

A Short Training in Medicine for the Scientist

Is it altogether premature and absurd to suggest that there is a real need of a training in medicine that will not lead to a licence to practise, nor to a position as a clinical investigator, but will give a student who is already equipped with a sound foundation in one or other of the basic sciences on which medicine is built sufficient knowledge of disease as it occurs in man to enable him to turn his special knowledge to account in the medical field? The training in the wards would, of course, have to be preceded by an adequate training in anatomy, physiology, and pathology—adequate that is for this particular purpose. But is it really sensible to deny to those whose help we badly need any insight into clinical problems, except on the condition that they work through a long and overcrowded curriculum,

and jump a number of examinational fences that were designed for a quite different purpose ?

The Ordinary Medical Student

I have in this address said nothing of the man whose future lies in general or consulting practice, or in the administrative field of public health. He falls, I think, into another category. The choice has to be made. You can be a research worker or you can be a practitioner. I do not believe that you can be both. Medical science, if you wish to serve her, demands all your time and energies ; so does medical practice. The choice will depend, if you are wise, mainly on your mental reactions, so far as you yourself can judge them. If you let other considerations weigh with you, you will risk all the discomforts of a square peg in a round hole. There are of course no hard-and-fast categories. Some men can be happy and successful either way ; but some, I think, cannot. There are minds that have a natural liking for searching out unsolved problems and following them through to a finish, or as near to a finish as they can. The problems must be sought or selected, not forcibly presented ; and the time and energy required for their solution must not be too greatly encroached on by a host of unrelated activities. Such minds will be profoundly unhappy if placed in an environment in which this unhurried continuous pursuit of some chosen problem is impossible. Medical practice is no place for them. There are other minds that work best under the stimulus provided by some insistent practical need, and that have the capacity of facing a multitude of problems at one and the same time, and enjoying the rush and turmoil of it all. Such minds often suffer boredom if forced to concentrate for long on a question that has no obvious practical issue. Given the requisite skill and sympathy, they will do well in practice ; but in the research laboratory they may find themselves on foreign soil. There is no better or worse in it, no higher or lower. It is a question of temperament. No one with any sense of values would attempt to balance the care of the sick against the discovery of new facts about disease. Both are things worth doing, and both need doing well, and with one's whole mind.

I do not mean, of course, that no advance in medical knowledge comes from practising physicians or surgeons ; that would be merely absurd. Their contributions have been many and important ; but any investigations that they undertake are incidental to their main work, and are therefore determined and limited by it. They have neither the time nor the opportunity to tackle problems of the type we have been considering.

The practitioner's daily work, however, presents him with endless opportunities for observation and for the accumulation of data that can be obtained by no one else. If his observations are properly made, and properly recorded, they may well be of great value, to others as well as to himself. There is, I think, a dangerous fallacy hidden in the conventional division between medical science and medical art. They may be regarded as antitheses. This is entirely false. Some part of medicine is "scientific," in the sense that we are able to apply clear and definite physiological or pathological knowledge in the diagnosis, prevention, or cure of disease. This field is rapidly enlarging, and each enlargement means a corresponding increase in the efficiency of our work. A large part of medicine would, at the moment, fall into the category of "art," in the sense

that we have as yet no "scientific" knowledge to apply. But the man who neglected his art whenever scientific knowledge was available would be a very poor practitioner, and the man who does the best he can when facing a practical problem in the light of half-knowledge, or with no "scientific" knowledge at all, relying on his own experience and his own observations so far as they will take him, is a perfectly good scientist. The thing that matters is that he should realise clearly what he is doing. He must use science, when science can help him ; and to use it he must have a working knowledge of it. Above all, he must avoid pseudo-science like the plague ; and that is not always easy. The scientific outlook, in this, which is its true sense, is just as important in practice as in research.

The Curriculum Leading to Medical Practice

I emphasised at the beginning of this address that I was discussing the medical curriculum as it affects the future research worker. In closing, I should like to make it equally clear that I am not suggesting that this is the angle from which the problem of future changes in that curriculum should be approached. It would be absurd, in considering any possible reforms, to allow the interests of that small band of men and women who intend to devote themselves to the academic side of medicine to weigh against the interests of the great mass of students whose future lies in practice, or in the administrative field of public health. All that I have done is to stress the importance, to the future research worker, of making full use of the preclinical years, and to suggest a possible avenue by which we might bring into the medical field research workers in other branches of science, whose entry as full partners is rendered difficult or impossible by our present system. If I were tempted to offer any suggestion as to the reform of the medical curriculum as a whole it would be that it needs a greater elasticity and some degree, at least, of differentiation. Apart altogether from the special needs of medical research, I do not myself see how a single rigid curriculum can possibly provide for the training of all those practitioners, specialists, semi-specialists, and medical administrators on whose activities the prevention and treatment of disease depends. There is, of course, a rapidly growing system of post-graduate diplomas and degrees that serve to train men and women for specialised medical activities, and these will certainly become more and more important in the future ; but there must be some limit to the total curriculum. If something could be done to lighten the general burden, to reduce the number of facts and the range of technical knowledge that have to be mastered by every medical student, so that he had a little time in which to think, it would, I believe, be a very great advantage to the profession as a whole. I have already referred to the suggestion of Sir Thomas Lewis that a modified and shortened medical curriculum might be followed, for those who wish to become clinical investigators, by a special course in scientific medicine. Could not this process of simplification and elimination during the earlier clinical years, with differentiation during the last year or so, be considerably extended, to the advantage of all concerned ? But such questions as these lead inevitably to a consideration not only of medical education but of the whole organisation of medical practice, and I have neither the time nor the courage—perhaps I should say the bravado—to enter on so thorny a field of debate.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

MATERNAL MORTALITY IN SCOTLAND

IN spite of the fact that some six months have elapsed since the publication of the report by two medical officers of the Department of Health for Scotland as the outcome of an inquiry into maternal mortality and morbidity in Scotland resentment is still being expressed by general practitioners here at what they regard as criticism of their midwifery. It will be remembered¹ that the report analysed the circumstances attending the deaths of 2527 mothers in childbirth, and estimated that 58·7 per cent. of these could have been avoided; 37·1 per cent. were attributed to some faulty technique of the attendant, including doctor, midwife, and institution in this category, and 21·6 per cent. to the failure of the patients to obtain advice or to follow the advice given. A circular is now being issued to all county and town councils in which the Secretary of State for Scotland urges them to consider in what directions the maternity services of their area may be improved. As a first step he suggests that a survey of the local maternity services should be completed by Feb. 29th, 1936. The circular also recommends local authorities to take immediate effective action on certain of the recommendations contained in the report, particularly as regards the provision of antenatal services, and to consider whether and on what conditions the services of obstetricians would be made available to general practitioners for consultative purposes.

VOLUNTARY HOSPITALS

At a meeting shortly before Christmas, Sir John A. Roxburgh, chairman of the Western Infirmary, Glasgow, described the voluntary hospital system as "a priceless possession." It would be a calamity, he held, if the voluntary principle could not be maintained and developed. Much could be done to maintain it by coöperation with the public health authorities. The chairman of the Royal Hospital for Sick Children, Glasgow, said that voluntary hospitals were entitled to State recognition and State protection so long and in so far as they continued to function efficiently. The voluntary hospitals recognised that they could not provide all the hospital services required, and were prepared to coöperate cordially with the rate-aided hospitals. Recent demonstrations of the confidence felt by Scottish people in this system are not lacking. The trustees of the estate of the late Mr. George Cuthbertson, shipowner, Glasgow, have announced that a sum of £116,000 will be allocated to various hospitals, churches, and other charitable bodies in Glasgow. The Glasgow Royal Infirmary and Glasgow Western Infirmary receive respectively £10,000 and £9,000.

A Government commission is now sitting in Edinburgh to consider the whole subject of the health services of Scotland.

DISPENSARY SERVICES IN GLASGOW

The remarkable increase in the popularity of the dispensary services of Glasgow during this century is the more striking when we realise that this period has seen many additions to the avenues through which medical advice may be sought. Dr. A. K. Chalmers, in an interesting analysis contributed to the *Glasgow Herald*, attributes the flock of attendances at the

dispensaries partly to the present drift towards the institutional treatment of disease, and partly to the gradual reduction in the numbers of the fee-paying classes. The figures of attendances at 13 of the principal dispensaries indicate that over 300,000 "first attendances" and "new cases," and over a million attendances were made during 1934. The attendances in the year 1901 were less than a third, and in the year 1911 little more than half those in 1934. Dr. Chalmers estimates that a population of about 1,704,000 is now served by the dispensary services in Glasgow. There is unfortunately a lack of coöperation between the dispensary physician and surgeon and the family doctor—a large proportion of the dispensary clientele coming to the dispensaries without any medical reference, and Dr. Chalmers fears that this tendency will impair the efficiency of both private and consulting practice.

PHYSICAL EDUCATION IN SCHOOLS

At the annual congress of the Educational Institute of Scotland, recently held in Glasgow, Dr. J. Jardine read a paper on physical education. Referring to intelligence tests, he said that while these had been of great service in educational classification, they provided only rough estimates of a child's natural capacity. No tests at present devised could differentiate temperamental manifestations or suggest a reason why one child was unstable and another stable. Dr. Jardine held strongly that the biological needs of the child should receive first consideration. He deplored what he described as the atmosphere of tension in the primary schools; large classes resulted in strain upon the teacher, and, through him or her, upon the children. Any system of education which demanded that the whole school day and all the evening should be given over to set tasks of an intellectual character was to deprive the child of its biological rights.

IRELAND

(FROM OUR OWN CORRESPONDENT)

A NATIONAL HEALTH INSURANCE BILL

ON Dec. 18th, 1935, Mr. Sean T. O'Kelly, Minister for Local Government and Public Health, introduced a Bill to amend the National Health Insurance Acts and also the Widows' and Orphans' Pensions Act. The text of the Bill has since been made public. As concerns National Health Insurance two important changes are proposed. One has to do with the method of electing a committee of management, and the other is the bringing of soldiers of the permanent force and members of the reserve force into the scope of National Health Insurance as if they were in the sole employment of the Minister for Defence. At present the Unified National Health Insurance Society, which includes all the previous approved societies, is governed by a provisional committee of three persons appointed by the Minister. This provisional committee was to exist for three years from the coming into force of the National Health Insurance Act of 1933, and was then to be replaced by an executive committee of fifteen to be elected by the insured persons. The effect of the present Bill will be to establish a different method of appointing the executive committee than that contemplated by the Act of 1933. The committee will consist of fifteen persons, but it will not be elected by the insured members. The chairman will be appointed by the Minister, who will also appoint

¹ See THE LANCET, 1935, ii., 159.

three persons to represent employers; the Trades Unions Congress will nominate three members; five will be elected on behalf of the insured by an "electoral college" made up of persons nominated by the local authorities on behalf of the insured in their several areas; the committee will be completed by the inclusion of the three trustees for the time being of the Unified Society.

MASTERSHIP OF THE COOMBE HOSPITAL, DUBLIN

Dr. Robert H. J. Mulhall Corbet has been elected master of the Coombe Hospital in succession to Dr. T. M. Healy, whose term of office had expired. Dr. Corbet is a graduate in medicine of the University of Dublin, and a fellow both of the Royal College of Physicians of Ireland and of the Royal College of Surgeons in Ireland. He has been assistant master both of the Rotunda Hospital and of the Coombe Hospital. The term of office as master is seven years, and it is hoped that during the tenure of the new master the hospital will move into a modern, completely equipped building.

UNITED STATES OF AMERICA

(FROM AN OCCASIONAL CORRESPONDENT)

EMERGENCY TREATMENT OF ACUTE ALCOHOLISM

Drs. L. S. Robinson and Sydney Selesnick who have to treat about 700 alcoholic patients yearly in the fifth medical service of the Boston City Hospital have devised a very rational and apparently successful method of treating the more severe cases of acute alcoholism that show coma, stupor, drowsiness, or ataxia. Study of the literature shows that the administration of carbon dioxide increases the respiratory excretion of alcohol, while administration of oxygen will save the life of rabbits that have received a dose of alcohol lethal to the controls. There is evidence that the oxygen is effective rather by speeding the oxidation of the alcohol than by relieving oxygen-want. The Boston doctors therefore have administered a mixture of 10 per cent. carbon dioxide in oxygen through an open slot mask. Blood chemistry observations were made before administration and after 30 minutes' inhalation of the mixed gases. The alcohol content of the venous blood was found to diminish more rapidly in treated patients than in controls. No carbon dioxide retention resulted from the treatment. The high lactic acid content of the blood of alcoholics was found to be unaffected by the treatment. Clinically the results were encouraging. Respiration became deep and regular almost at once. The patient changed rapidly from a cyanotic cold person to a pinkish warm one. After half an hour he would breathe normally left to himself; also he could be aroused by painful stimuli. The treatment is recommended not as routine but as emergency treatment of acute alcoholism where danger of paralysis threatens life.

SURVIVAL OF MICRO-ORGANISMS AT LOW TEMPERATURES

The increasing consumption of frozen fruits and vegetables in this country lends interest to observations made by the Bureau of Plant Industry (Dept. of Agriculture) on survival of micro-organisms at low temperatures. Twenty-six species of bacteria, yeasts and moulds were isolated from fruit that had been stored for three years at 15° F., and were transplanted to freshly made beef infusion agar adjusted to pH 7.0. These slant cultures were placed in the 16° cold-storage room at the Arlington Experiment Farm. After three months definite growth even at

this low temperature was found to have occurred in three of the transplants—all of them yeasts. Between five and seven months growth was observable in five more cultures. At the end of a year all cultures were brought into the laboratory, allowed to thaw out, and incubate at room temperature. All but 5 of the 26 species showed an "exceptionally large amount of characteristic growth" in 24 hours.

PARIS.

(FROM OUR OWN CORRESPONDENT)

THE CAMPAIGN AGAINST VENEREAL DISEASE IN GRENOBLE

Dr. Butterlin, who is in charge of the venereal disease service of the Department of the Isère, gives an encouraging account of the progress effected in this Department since the introduction of a minor revolution in the control of prostitution and the provision of free treatment. While most of France continues to cherish hopes of the efficacy of official medical control of prostitution, the authorities of Grenoble have broken with this tradition and, after suppressing prostitution as a State-regulated profession, have provided a central venereal disease service in Grenoble itself, and five branches of this service in other parts of the Department. The Grenoble service assures the strictest secrecy and is open every evening, with one section for men and another for women. The treatment given on the spot is controlled by serological and bacteriological examinations undertaken by the Department's medical staff. Dr. Butterlin's statistics for the past six years show that, with a great rise in the number of attendances, there has been a fall in the number of new cases of syphilis and chancroid. During these six years the annual number of attendances has risen from 7000 to 27,300. In 1929, 79 syphilitic chancres were observed. This figure rose to 144 in 1930, and fell in 1931 to 115. The corresponding figures for the next three years were 38, 30, and 41. The decline in the number of chancreoids seen has been even more dramatic; from 1924 to 1929 some 15 to 25 such cases were seen every year, but during the last two years chancroid has disappeared more or less completely. The figures for gonorrhœa are less encouraging, presumably because of the notorious difficulty of diagnosing early and treating effectively the gonorrhœa of women.

THE DEATH OF PROF. WALTHER

Prof. Charles Walther, who died just before Christmas, packed into his long life most varied activities, although he was always the scientific surgeon. He brought to his studies a methodical and logical mentality which marked his actions whether they concerned research, operative technique, or administration. He was professor in the Paris faculty of medicine, chirurgien honoraire des hôpitaux, president of the International Surgical Association, and Grand Officer of the Legion of Honour. He received the Croix de Guerre for his wartime services which included the administration of two important surgical centres in Paris (the Val-de-Grâce and the Pitié). In 1918 he was elected member of the Academy of Medicine, and until 1934 he was a familiar figure in the chair at its meetings. He had much to do with the introduction of the practice of swabbing the field of operation with tincture of iodine, and he made important contributions to the study of appendicitis, nerve lesions, cancer of the tongue, and local anaesthesia with cocaine.

OBITUARY

WILLIAM COLLIER, M.D. Camb., F.R.C.P. Lond.

Now and again there appears in a city a man whose life and work make an enduring impression, who possesses that mysterious quality, prestige, a quality which depends not upon worldly success or professional acumen, but upon a subtle combination of ability and personality associated with a disinterested devotion to ideals of conduct and leadership which distinguish him from his fellow men. Such a man was Dr. William Collier, whose death on Dec. 21st is deeply mourned by all in Oxford who knew him as friend, physician, or colleague.

Collier's was an interesting life and a chance contact was responsible for his adoption of the profession which he subsequently came to practise and adorn. The youngest of five children of Henry

Collier of Stapleford, Cambridge, he was born in 1856, and after passing through Sherborne School he entered Jesus College, Cambridge, without any clear idea as to his future. The spirit of adventure which was a feature of his whole career led him to give up his academic course and to join an expedition to explore the possibilities of flooding the Sahara. In the preliminary reconnaissance by sailing ship of the northern coasts of Africa,



DR. COLLIER

Collier was afflicted by such disastrous sea-sickness that he was compelled to abandon the venture, being landed penniless at Teneriffe. Having recovered his strength he attempted to secure a return passage by a ship sailing for England, but the captain—a cautious Scot—refused a cheque, and Collier was sent ashore. From this dilemma he was extricated by a passenger who voluntarily produced the passage money and Collier returned to England and Cambridge. Here by chance he met Sir George Murray Humphry, whose advice to control his enthusiastic and adventurous spirit came to Collier as something of a shock. Humphry suggested medicine as a possible career and this advice was followed, Collier taking a pass degree, all that was possible to him after the interruption of the African adventure. His wise counsellor retained a keen interest and friendship for the young man in after years.

At King's College Hospital Collier acted as dresser to Lister who had come to London in 1876, and on qualification (in 1880) he took up the post of house physician and pathologist at the Wolverhampton General Hospital. A short experience followed in a fashionable practice in Hastings, which he found distasteful and he gladly presented himself for the post of house physician to the Radcliffe Infirmary, Oxford, to which post he was appointed in 1881, being elected a physician to the hospital in 1885, and in this year he obtained his M.D. Cambridge.

In 1886 he obtained the membership of the Royal College of Physicians to which he was elected a fellow in 1892. As a physician and teacher, while conducting his own practice, he built up a reputation as a consultant among his colleagues both in the city and county, his work being distinguished by a wisdom, sympathy, and sound judgment which were characteristic of his matured outlook on life. As a proof of the high esteem in which he was held by his colleagues he was presented, in 1929, with his portrait painted by the Hon. John Collier, an exceptionally successful likeness which is reproduced with this obituary notice.

An enthusiastic, vigorous, and far-sighted promoter of many schemes for the reform of professional, hospital, and social services, Collier was a generous opponent, quick to grasp another's point of view, and with a sense of humour which never deserted him in debate or intercourse. He once said of himself that he "had never hated any man," a rare attribute in a man who was a determined fighter in any cause which he had taken up, but an observation to the truth of which all who knew him will subscribe. One very important service which he rendered to the Radcliffe Infirmary was the successful organisation of the 2d. Contributory Scheme in 1920, the first of its kind in a county rural district, a scheme which in the past year has produced over £40,000 towards hospital services in the area. In a long, active, and useful life Collier held many posts of distinction and lived to see many of his ideas realised in practice; his memory and his keen interest in people and affairs he retained to the end, and his remarkable physical activity is evidenced by the fact that at the age of 75 he ascended the Pillar Rock in Cumberland.

Dr. Collier married Anna, daughter of the Rev. Dr. James Legge, first professor of Chinese in the University of Oxford. His widow and two daughters survive him. Of his two sons one, Dr. W. T. Collier, M.C., F.R.C.P., physician to the Radcliffe Infirmary, died at the age of 43; the other, Lieut. Martin Collier, R.N., lost his life during the war. A daughter, Dr. Ivy Collier, died in 1927.

F. G. H.

ARCHIBALD STANLEY PERCIVAL, M.A. Durh., B.Chir. Camb.

CONSULTING SURGEON, NEWCASTLE-UPON-TYNE EYE HOSPITAL

THE death occurred on Dec. 22nd at Shenley, Woking, of Mr. A. S. Percival, the ophthalmic surgeon who for some 30 years was a leading authority on many aspects, especially the mathematical ones, of his specialty.

The son of Mr. Stanley Percival of The Hermitage, Woking, he received his preliminary education at Repton, proceeded to Trinity College, Cambridge, as a science scholar, and graduated in 1884 with a first class in the Natural Sciences Tripos. He went to St. George's Hospital for his clinical training, graduated as M.B., B.Chir. Camb., and held various house appointments, including that of house surgeon at the Royal Westminster Ophthalmic Hospital. His experience there determined his future career, for shortly afterwards he was appointed ophthalmic surgeon to the Children's Hospital, Newcastle-on-Tyne, and in Newcastle he practised as ophthalmic surgeon until his retirement in 1928.

Percival was from the very beginning of his career attracted by the mathematical side of his specialty, and although all his elaborate work was in his own interest directed towards the improvement of

clinical methods and the smoothing away of difficulties both in diagnosis and treatment of ophthalmic disorders, his contributions to the subject assumed for their comprehension a mathematical knowledge and perception denied to most clinicians. Percival was always unaware that there are people who cannot read and detect at a glance the significance of elaborate equations, but his writings were mostly confined to the special journals, where the appeal was to an instructed audience. He contributed to the *Archives of Ophthalmology*, to the *Ophthalmic Review*, to the *British Journal of Ophthalmology*, as well as to the *Transactions* of the Ophthalmological Society articles on bifocal lenses and the action of prismospheres and decentred lenses; on the action and uses of prismatic combinations; on periscopic lenses; on the correction of astigmatism by tilting spherical lenses; on colour phenomena; and on decentration and oblique cylinders. To the *Transactions* of the Northumberland and Durham Medical Society he was also a frequent contributor, writing on convergent and divergent squint, errors of refraction in relation to headache, and faulty tendencies of the ocular muscles.

In 1899 he wrote his first book entitled "Optics, a Manual for Students" which showed him immediately as an original worker along the mathematical side of optics, the attempt being to arrive at the knowledge of the laws underlying observed phenomena and to devise means for the attainment of certain results. Here Percival was a direct follower of Isaac Newton, and his manual, although by the implication of its title directed to students, was really an advanced mathematical treatise going far beyond the ordinary restrictions of algebra and geometry observed in any teaching text-book. For example a knowledge of the properties of caustics is essential to a due comprehension of the theory of optical instruments, and for spherical reflectors most of those properties can be studied in the generating epicycloid. With this object the reflector is usually referred to rectangular coördinates, the first differentials of which define the position of the reflected ray and the second differentials the locus of the intersection of two consecutive rays. Percival materially simplified this complicated part of the subject by a new and ingenious application of mathematics. He published in 1913 a short volume, entitled "Geometrical Optics," which may be regarded as an expansion and simplification of the more elementary chapters of the earlier treatise, and those students who had the necessary grounding, or were not discouraged by the abundance of algebraic symbols, were rewarded by a conception of the optical problems of ophthalmology which might be of high value in ophthalmoscopic work and the correction of refractive errors. He also wrote a useful treatise on practical integration, and an elementary work on the principles of perspective in drawing.

Mr. Percival retired from practice eight years ago, returning to his native town of Woking. He married Winifred, the daughter of the late Mr. William Warner, who predeceased him by many years.

**FREDERIC HIBBERT WESTMACOTT, C.B.E.,
B.Sc. Vict., F.R.C.S. Eng.**

Colonel Westmacott, who died in Manchester on Dec. 20th, was a man of striking personality. His native town, which knew him as "Freddie" Westmacott, noted his love for the military side of medicine, and for the law and order which goes with it, and will miss his presence much. Had he

devoted himself entirely to the Army medical services he would have risen to high position, but otology and Manchester would have been poorer.

Related to Richard Westmacott whose sculpture of the Good Samaritan adorns the seal of the Manchester Royal Infirmary, Frederic Hibbert Westmacott was born in 1867 at Crumpsall Grove, Manchester. Educated at the Grammar School and at Owens College, he qualified in 1890 and became F.R.C.S. Eng. four years later. His early clinical experience was acquired at the Royal Infirmary, the Children's Hospital, Pendlebury, and the Barnes Convalescent Hospital, Cheadle. Then for a time he travelled in the East, going out on the Bibby Line s.s. *Shropshire* and joining in the Burma Expedition, for which he earned the first of his many military medals. Before returning to Manchester, having decided to adopt otology as his specialty, he spent a year in the aural clinics of Vienna; in his early days he was hampered for want of hospital beds, until in 1913 he became assistant aural surgeon to the Royal Infirmary, succeeded Sir William Milligan in 1924, and retired in 1927 on reaching the age limit. He held other posts at the Pendlebury Children's Hospital and St. John's Hospital. After retiring from hospital work he carried on a busy private practice, recently spending some of the winter months at Monaco. For the last few years his health had declined, although he was unwilling to save himself as he might have done



COLONEL WESTMACOTT

[Photograph by F. W. Schmidt]

Westmacott's military life started as a private in the (then) 2nd volunteer battalion of the Manchester Regiment, later he was transferred to the local R.A.M.C., becoming surg.-lieut. of that corps. At the outbreak of war he was registrar of the local territorial hospital, the 2nd Western General. A year later when J. W. Smith relinquished the post he became officer in charge and spent his time between this hospital and the 57th General Hospital which served in France and Italy. He was for some time A.D.M.S. at Marseilles. The size and importance of the 2nd Western, to a large extent a product of Westmacott's energy, may be realised from the 235,900 patients admitted during the war, the 107,801 medical boards held there, and the 75 medical officers who were attached to it in addition to 27 civil practitioners. In 1920 he was appointed A.D.M.S. to the reorganised 42nd (East Lancashire) Territorial Division. His quick grasp of a situation, his sense of what might be improved and how to do it, combined with his mastery of ritual never left him at a loss whether in his masonic or his military work. His capacity for enforcing obedience was a by-word and his organising capacity was seen at its best as chairman of the entertainments committee when the British Medical Association visited Manchester in

1929. It was during the work of that eventful week that he had a heart attack which made many of his friends anxious.

He received many honours. The one that he appreciated especially was that of honorary surgeon to the King conferred in 1927. He was deputy lieutenant of the County of Lancaster, and Knight of Grace of the Order of St. John of Jerusalem. He was appointed C.B.E. in 1919. In 1904 he married Margaret Carlota, third daughter of Alexander Howden, who survives him.

An old friend writes: "Though holding decided views which he did not hesitate to advocate forcibly yet his obvious sincerity and his genial manner assisted in overcoming opposition, so that Westmacott usually succeeded in obtaining his own way. A dogged perseverance obtained most of the objectives upon which he had set his heart. His career as a medical student had not been brilliant and fellow students smiled when he announced his intention of taking the F.R.C.S., yet after a slight disappointment at the primary examination he confounded his critics by passing the final at the first attempt. Another goal he desired was to be A.D.M.S.—the highest office in the A.M.S. attainable by a non-regular—and in the later years of the war he was appointed A.D.M.S. to the Marseilles area and the 42nd Division. He was undoubtedly a great organiser and administrator, first as registrar and O.C. of the 2nd General Western Hospital and afterwards as O.C. of the 57th B.G.H. in France. His knowledge of French and German proved most useful in the early days of the 2nd Western, when so many wounded Belgians and German prisoners-of-war were admitted. His organisation of entertainments at the B.M.A. Manchester meeting of 1902 was so well remembered that in 1929 all the committees dealing with entertainments and transport were combined under his chairmanship. First-aid and ambulance work always had a great attraction for him; his experience as a judge of competitions between ambulance teams must have been unique. Westmacott had many social interests and engagements into which he entered with untiring energy. He enjoyed life to the full and will be sadly missed by a wide circle of friends."

**ARTHUR EDWARD GILES, M.D., M.R.C.P. Lond.,
F.R.C.S. Edin.**

CONSULTING SURGEON, CHELSEA HOSPITAL FOR WOMEN

WE regret to announce the death at Welwyn, Herts, on Dec. 26th, of Mr. A. E. Giles, the well-known surgeon and gynaecologist.

Arthur Edward Giles was the son of Mr. Samuel Giles of Bombay, where he was born in 1864. He had a varied preliminary education, being a student at the City of London School, the Havre Lycée, and the Manchester Grammar School, while he completed his medical training at Owens College, Manchester, where he entered in 1883. At Owens College he was Platt physiological scholar; he graduated as M.B., Ch.B. Vict. in 1888, and M.B. Lond. in 1891, securing first-class honours in obstetric and forensic medicine. In 1892 he proceeded to the M.D. Lond., qualifying for the gold medal, and then undertook a long course of post-graduate work in Berlin, Vienna, and Paris. In 1893 he took the diploma of M.R.C.P. Lond., and a little later that of F.R.C.S. Edin. After holding residential posts at the Manchester Royal Infirmary and the Crumpsall Hospital, Manchester, and the General Lying-in Hospital, Lambeth, Giles secured in succession appointments to the staffs of the St.

Pancras and Northern Dispensary, the Chelsea Hospital for Women, the Prince of Wales's General Hospital, Tottenham, and the Marylebone Dispensary, and by his strenuous and enthusiastic work he made for himself a prominent position as a gynaecological surgeon. His connexion with the Chelsea Hospital for Women was a very long and valuable one. He was elected on the staff of the institution as assistant surgeon over forty years ago, and was consultant surgeon at his death. Through his work here he became a recognised authority on the technique of gynaecological surgery—possibly not so widely recognised as he deserved, for he was a great clinician.

As a writer Giles at the earlier stages of his career was profuse but practical. He wrote the article on gynaecological operations in Carson's "Operative Surgery," and that on hysterectomy in Eden and Lockyer's "System of Gynaecology." It would serve no purpose to enumerate the many clinical articles which he contributed at various times to our own pages and those of our contemporaries, but the communications generally arose from experiences in his varied institutional practice and had the stamp of personal knowledge. Early in his career he participated with Sir John Bland-Sutton in the production of a book which ran through some nine or ten editions and the teaching of which is still essentially sound. This book—the "Diseases of Women, a Handbook for Students and Practitioners"—set out to relate facts and describe methods in connexion with gynaecology in such a way that students might find the information valuable in their training and practitioners realise the advantages to their patients that followed prompt and proper surgical treatment. The book laid itself



MR. GILES

(Photograph by Histed)

open, despite its title, to being largely a manual of operative surgery, so slight was the stress laid on the value of medical treatment, and in other directions did not meet with universal approval, but the personal opinions were honestly given, and the teaching, within its limitations, was seen to be sound.

In recent years Giles took a deep interest in two subjects loosely related to each other—namely, the occurrence of sterility in woman and the need for medical teaching on birth control. In a short book on sterility Giles summarised much of the accepted knowledge on the matter, and attempted to determine the percentage of cases in which where a marriage had been sterile the fault lay with the male. He was only able to show, however, how difficult it must be to arrive at any certain conclusions, though he thought that the husband might be at fault in from 10 to 50 per cent. of the cases, a figure which clearly has little informative value. He estimated that the proportion of sterile marriages in this country

in the era succeeding the war was 10 per cent. for the working population and 16 per cent. for the leisured classes, and he closed his monograph, which contained a number of original observations, with a pathological and clinical classification of the causes of the condition. His views on birth control were made known in an address delivered before the Manchester Medico-Chirurgical Society (vide *THE LANCET*, 1927, ii., 165) in which the medical and gynaecological grounds for birth control were adequately set out and a clear description was given of the methods to be adopted. His general conclusion was to the effect that birth control being a necessity in certain circumstances, and expedient in a few cases, the medical profession should lay down its indications and point out its limitations.

During the war Giles served with the rank of major in the R.A.M.C., and was surgeon in charge of the Anglo-French military hospital at Tréport in 1915, and civil surgeon to the Hampstead military hospital in the following years. At Tréport he suffered from an acute septicæmia following an accidental wound while operating at Lady Murray's hospital. At the close of hostilities he went to live at Welwyn, where for many years he had had a week-end cottage, and was already consulting surgeon to the Queen Victoria Cottage Hospital. His skill as a surgeon and his unvarying kindness and courtesy to the patients greatly increased the utility and reputation of this small institution, and to the end of his life he took an interest in its working. While he still practised from his London address he lived in Welwyn, and was at the beck and call of the whole community in a consulting or operative capacity, going to the hospital at any hour of the night in response to calls. The new building of the hospital was opened in 1934 by the Duchess of York, and he performed the first operation which took place in its wards. And when he became ill only shortly before Christmas he entered a private ward of the hospital and died there on Dec. 26th, mourned by the whole neighbourhood.

Giles was consulting gynaecological surgeon to the Prince of Wales's Hospital, to the Chelsea Hospital, and the Sutton and Wood Green Hospitals. He had served as president of the section of obstetrics and gynaecology in the Royal Society of Medicine, and was a vice-chairman of the council of the East London Hospital. He was a past master of the Drapers Company, and music was among his wide interests; one of his compositions was played recently at a conversazione at the Royal Society of Medicine. He married May Hartree, daughter of the late Mr. A. A. Tindall.

MEDICINE AND THE LAW

Agranulocytosis and Amidopyrin

AN inquest on another case of suspected agranulocytosis was held at St. Pancras Coroner's Court on Dec. 27th, within a week of that recorded in our last issue. The victim was a man aged 47 who had been in poor health for two years and had been treated for fibrositis by diathermy, but not, according to his widow, by drugs until two months ago when he had bought a bottle containing 100 five-grain tablets of Novalgin. Between them husband and wife had consumed 91 tablets, the husband accounting for about 60. The widow said that she had not mentioned the tablets before because she did not think that the drug had anything to do with her

husband's symptoms—i.e., shivering and sore-throat. Sir Bernard Spilsbury said that the microscopical changes in the body were remarkably like those of the previous case, but that it was difficult post mortem to prove any effects upon the blood. The striking absence at the autopsy of any marked change in the organs had made him suspicious. He was now satisfied that death was attributable to the drug. The coroner, Dr. Bentley Purchase, said that from the beginning the case had struck him by its similarity to the other, but it was not until the widow had mentioned novalgin that any connexion was revealed. Pyramidon and novalgin, though differing in their constitution, contained a common chemical group (pyrazolon). He again emphasised that though this type of drug was valuable its use needed great care; he proposed to refer the case to the Poisons Board and returned a verdict of death by misadventure.

Sale of Dentist's Practice

The sale of a dentist's practice in Wimpole-street has raised a doubtful point of income-tax law. The purchase agreement specified a "primary" price of £15,000, subject to variation as subsequently explained. Of this sum £5000 was to be paid forthwith; the purchaser was to pay the balance by annual payments over the next ten years in the form of 25 per cent. of the net profits of the year; these ten-year payments were to increase or diminish the "primary" price of £15,000 according as they came to more or less than £10,000. They were to be regarded as capital sums paid in respect of the purchase price. This arrangement gave the buyer the advantage that he would be paying according to the actual value of the practice. He sought the further advantage of deducting these annual payments from income for the purpose of his super-tax returns. In a particular tax year the payment turned out to be £886. He claimed that this was in the nature of income and not a capital sum, and that it could therefore be deducted in ascertaining his own taxable income. The Special Commissioners agreed and allowed the deduction. So did Mr. Justice Finlay. The Court of Appeal, however, took a different view last month. The Masters of the Rolls said the question was whether the purchase agreement contemplated the payment of a sum of money (payable in instalments or otherwise) or an annuity. The agreement fixed £15,000 as the purchase price from beginning to end; the ten-year percentage payments might have the effect of varying the total of this lump sum, but they did not alter the legal position. They were not annuities but instalments of a definite lump-sum price. It followed that the £886 could not be treated as income. It was capital and it could not be deducted from income for purposes of super-tax return. And now the experts who assist professional men over the purchase of a practice will perhaps turn back to the idea of payment in the form of annuities. It will depend on whether they are advising a prospective buyer or a prospective seller. The seller in the Wimpole-street case would probably have been surprised if income-tax had been claimed from him on the instalments of the purchase price.

ROYAL PORTSMOUTH HOSPITAL—Over £79,000 has been spent upon extensions to this hospital. Subscriptions received during the year amounted to over £7000 bringing the total sum collected to over £75,000, while about £10,000 more has been promised. Three of the wards of the new block have been in occupation for some months.

CORRESPONDENCE

ROYAL MEDICAL BENEVOLENT FUND

To the Editor of THE LANCET

SIR,—I have once more the pleasant duty of thanking you for the help you have given the committee of the Royal Medical Benevolent Fund in respect to the Xmas gifts for our beneficiaries.

The response of our medical brethren has been very prompt and generous, the amount raised is £819 4s. 3d., an increase of £148 9s. over last year.

The replies of the beneficiaries are, many of them, pathetic, indicating how this gift has been most useful in respect to fuel, and other Xmas comforts.

Believe me,

Yours sincerely,

Wimpole-street, W., Jan. 1st, 1936. THOS. BARLOW.

PAIN AND EUTHANASIA

To the Editor of THE LANCET

SIR,—You have been admonished by Dr. Piney for opening your columns to the discussion of voluntary euthanasia. There is little doubt that the general practitioner, on whose shoulders falls the responsibility of seeing these unfortunate patients through the penultimate stage of their illness, and who can speak with authority on the matter, is deeply interested in the subject. There is, moreover, a large section of the lay public who read THE LANCET and look for intelligent guidance from medical men on a subject which concerns the community as a whole.

Mr. Bankart and Prof. Rogers remind the medical profession of another palliative measure to relieve pain, namely, chordotomy, but all practical surgeons are familiar with this procedure, and equally familiar with the extremely limited scope of this operation. Their reminder is given with a bland assurance which is apt to mislead, and to leave the impression that with chordotomy the problem is solved. Only too well we know that for cancer of the tongue and pharynx, of the thyroid and larynx, and of that terrible disease, cancer of the œsophagus, chordotomy is impracticable.

There is a widespread belief that incurable and lingering cases of fatal disease are ministered to by trained and sympathetic nurses and by every resource that can be devised by medical science in hospitals or homes for incurables. The hideous truth is that the majority of these cases are discharged from hospital and terminate their pitiable existence in working-class homes or even in slum dwellings. Even in hospitals, when all cases which can be given effective palliative treatment have been discounted, there still remains a residuum, for whom alone this Bill is designed, the relief of whose sufferings is beyond the skill of our profession.

The root of the matter is not the mental distress of relatives, nor the abstract conscientious scruples of those who are not themselves suffering pain; it is for these cases, which are alleged to be few in number, that a method of escape from intolerable pain of body and distress of mind is sought. How few or how many these cases may be, remains to be seen, but I suggest that the testimony of the family doctor is the most valuable on this point. It is marvellous with what equanimity we bear the misfortunes of others, comforting them with the spectacle of the Thief on the Cross, the duration of whose sufferings, by the by, was measured in hours not in weeks or even months, and whose punishment for his crimes

was in accordance with the code of justice that obtained 2000 years ago.

I am, Sir, yours faithfully,

H. H. GREENWOOD,

Member of the Consultative Council of the Voluntary Euthanasia Legalisation Society.

Swindon, Dec. 30th, 1935.

LORD NUFFIELD'S GIFT

To the Editor of THE LANCET

SIR,—Lord Nuffield, it will be remembered, has already done great things for cripples. First came his magnificent gift of £70,000 for the rebuilding of the Wingfield-Morris Orthopædic Hospital in 1933; then early in 1935 he gave £60,000 to New Zealand, and soon after £50,000 to Australia, toward the discovery and treatment of children crippled or attacked by some crippling disability. For a long time Lord Nuffield has been anxious to help forward this work in Great Britain, in order that in every area adequate provision may be made for the early and efficient orthopædic treatment of every child, adolescent, or adult in need of it. And now, as recorded in your last issue, he has given the sum of £125,000 for this purpose. The major part of this sum will be allocated to a Lord Nuffield Central Fund which is to be applied at the discretion of the trustees during the next four or five years to develop the discovery, cure, and care of cripples in the various districts where this work is not being at present specifically undertaken, or is being undertaken on an entirely inadequate scale. Much credit is due to the Central Council for the Care of Cripples that many parts of the country are already well organised. But there are districts where a great deal remains to be done; their requirements will be explored and recommendations made to the trustees of the Fund for grants in aid of new work.

Lord Nuffield is devoting another part of his benefaction to the endowment of a scholarship in orthopædic surgery; this is to be tenable for two years at the Wingfield-Morris Orthopædic Hospital, Headington, Oxford, with a travel period of three months to follow. He hopes this will attract and be of value to young surgeons who are specialising in orthopædic surgery. It will provide an opportunity of working in an orthopædic hospital of the most modern design, and with a well-established outside organisation for the early discovery of potential cripples, their out-patient treatment, and their after-care. It is proposed that the regius professor of medicine of Oxford and the president of the British Orthopædic Association shall be on the small electoral body for this scholarship.

I am, Sir, yours faithfully,

Oxford, Dec. 27th, 1935. G. R. GIRDLESTONE.

NARCO-ANALYSIS

To the Editor of THE LANCET

SIR,—Recent allusions in the newspapers to the use in America of "truth serum" ignore the fact that certain drugs facilitate not only the divulgence of carefully guarded secrets but also the restoration of forgotten memories. Such possibilities are of interest not only to the criminologist but also to the psychiatrist. The successful combination of narcosis with psychotherapy would be a real advance in mental treatment. Many writers have referred to the value of such a combination, but so far as I know the

narcopsychological approach has not progressed beyond the method of simple suggestion. This is due to the stupefying effect of the narcotics employed.

In an attempt to extend this line of investigation, I have experimented with Somnifaine, Sodium amytal, Sodium soneryl, Nembutal, and a combination of Evipan with Avertin. I find nembutal the most effective in producing sedation with the minimum of confusion. I have evolved a technique which I call "narco-analysis."

The usual routine examination is made and the patient is then prepared as for a general anæsthetic. A state of light narcosis is produced by the slow intravenous injection of a 2½ per cent. solution of nembutal. During the injection every effort is made to make the patient amenable to hypnotic analysis. The resulting willingness of the patient, the release of inhibitions, and the ability to recall experience, recent or remote, makes analysis relatively simple and speedy. In an hour the physician obtains a quantity of relevant information which he would not have obtained in a month by ordinary methods. A true hypnotic state is induced, and this facilitates suggestion, which must be given with great care and forethought. It is directed in all cases towards restoring the contact of the patient with the realities of his life and environment.

The séance is prolonged for about half an hour and then merged into deep narcosis by a further injection of nembutal. The same technique can be repeated if necessary on successive days. The following is a typical case:—

A single woman, aged 37, was brought to hospital for temporary treatment under Section 5 of the Mental Treatment Act, 1930. The recommendations stated that for six weeks she had been abnormally depressed, deluded as to her identity, and grossly disorientated. A week after admission her condition was unchanged. Narco-analysis was begun on the eighth day. She at once became calm and coöperative, and recalled significant forgotten memories which were of value in re-establishing environmental contact. Two séances secured a total of 50 hours' sleep. On waking she described a dream symbolising her recovery. From this moment she remained bright, cheerful, and amenable. A fortnight later she was discharged recovered.

This case is illustrative of some 130 treated by the same method. The results have been encouraging in all of them, and I hope in due course to report the results in detail. I am indebted to Dr. P. W. Bedford, medical superintendent of this hospital, for permission to publish the above case.

I am, Sir, yours faithfully,

J. STEPHEN HORSLEY,
Senior Assistant Medical Officer,
Dorset Mental Hospital.

Dec. 10th, 1935.

PLEURAL SHOCK AND/OR AIR EMBOLISM

To the Editor of THE LANCET

SIR,—Whilst agreeing with the conclusion reached in the editorial article in THE LANCET of Dec. 28th—namely, that this accident of artificial pneumothorax may well be avoided altogether by careful technique—I do not think the methods suggested are necessary or even wise, nor do I think the usual mechanism of air embolism can be that which you describe. As this complication occurs more frequently during refills than during inductions, it does not seem very likely that it is caused by puncture of the lung or of an adhesion, both of which must take place much more frequently during the first attempted injection than later. Even from a mechanical point of view this seems an unlikely accident. Most apparatus is

reasonably airtight, and the volume of air contained in the accessory tubing must be a good deal less than 75 c.cm., but let us suppose for the sake of argument that this large volume of air is contained in the tubing, and let us further suppose that the suction in the vein entered is equal to a pressure of 13 cm. of water or 1 cm. of mercury. It is of course most unlikely to be so high, as experience of manometer readings shows that records of this order are never obtained except when the point of the needle is in the pleural cavity. Experience also shows that there is considerable resistance even in a fairly wide bore needle, which damps manometer fluctuations and obstructs the rapid flow of air, but let us ignore this resistance. The volume of the air therefore in the tubing will expand under the reduced pressure,

and a volume $75 \times \frac{76}{75} - 75 = 1$ c.cm. of air will be free to enter the vein. Is it possible for so small a quantity of air, after being churned up and partly absorbed by the blood in the heart and great vessels, to cause serious symptoms? We have considered an extreme possibility; in ordinary circumstances the volume which could in this way enter the vein would be far less, and moreover would enter slowly owing to friction in the needle. I cannot believe that this is the mechanism of air embolism, provided of course that air from the storage compartment is not allowed to flow through the needle before assurance is made that the point is in the pleural cavity.

On the other hand, during either inductions or refills adhesions may be torn by the retracting lung. These are, moreover, more likely to contain lung tissue when lacerated by the powerful retraction of an already partly collapsed lung, that is during refills, than when severed by the comparatively feeble pull of the almost fully expanded lung, that is during inductions. Spontaneous pneumothorax complicating artificial pneumothorax and due to laceration of an adhesion is not an infrequent happening. It is, therefore, easy to conceive of air embolism being caused by a tearing of an adhesion containing a branch of the vein, and thus allowing air from the pleural cavity to enter the circulation freely, in just the same way that air may flow from the air passages into the pleural cavity, should the adhesions contain portions of the lung in communication therewith.

The prevention of air embolism is therefore, I hold, the adoption of a technique which does not produce extreme tension in any adhesion, unless this is felt to be desirable after a careful consideration of all aspects and of all dangers, and then taking care to ensure that this tension is not suddenly applied.

I am, Sir, yours faithfully,

C. O. S. BLYTH BROOKE,
Tuberculosis Officer, Borough of Finsbury.
Dec. 23rd, 1935.

ATEBRIN POISONING

To the Editor of THE LANCET

SIR,—I read with interest the report by Drs. Fernando and Wijerama of a fatal case of Atebrin poisoning, published in your issue of Nov. 9th. The following case, admitted to the Mysore Government Mental Hospital, Bangalore, presented neurological and psychiatric symptoms, following the administration of atebrin, which may be worthy of notice:—

The patient, a flabby male aged 32, was referred on Nov. 19th, 1935, by his medical attendant for protective

observation because he showed acute maniacal symptoms. He had been having daily attacks of malaria for the past three weeks, and quinine administered during the first week had given no relief. During the eight days before admission he had two pills of atabrin daily, and three injections of atabrin mussonate. Fever had subsided, but 24 hours before admission he had become destructive and violent.

Physical Examination.—The patient was very restless, throwing about bed-clothes, and had to be restrained. He was deeply jaundiced. The liver and spleen were not palpable, and there was no evidence of hepatic pain; the tongue was thickly coated and the breath foul. The pulse-rate was rapid, 120 per minute, of low tension, irregular, missing one in every 10–12 beats. The apex-beat was within the nipple line, but a soft uncondensed, systolic murmur replaced the first sound in the apical and pulmonary areas. The pupils were moderately dilated and reactive, but there were coarse, rapid, nystagmoid jerks, about 16 per minute, making it almost impossible for the patient to fixate. He had fine tremors of the tongue and hands. Speech was slow and hesitating, but there was no dysphasia. The reflexes were sluggish except the knee-jerk, which was + + + +. No Babinski sign.

Mental Examination.—Restless; psychomotor activity increased of both the small and large joints; disorientated with reference to time and space; he would shout that snakes and fantastic animals were crawling on the floor,

and reacted to such visual hallucinations with fear, violence, and emotional instability.

Laboratory Findings.—No malarial parasites found. Urine scanty, reaction acid, no sugar or albumen found; no bile pigments or atabrin were present. Faeces foul-smelling, but yellow and not clay-coloured.

Progress and Treatment.—The patient was given immediately a magnesium sulphate enema, and on account of his restless and non-coöperative state, a paraldehyde enema. He passed a quieter night. He was put on daily injections of cyclotropin (five days) and strychnine gr. 1/20 b.d., and general treatment like daily warm sponging. His mental symptoms cleared up within three days and his jaundice on the seventh day. On Nov. 29th, 11 days after admission, he was discharged recovered, though somewhat weak.

The case is of interest as showing mental symptoms suggestive of delirium tremens (the patient was a total abstainer) and neurological symptoms suggestive of an involvement of the labyrinthine cerebellar extrapyramidal pathways. I have seen several cases of santonin poisoning with similar symptoms.

I am, Sir, yours faithfully,

M. V. GOVINDASWAMY,
Superintendent, Mental Hospital,
Bangalore.

Dec. 12th, 1935.

PUBLIC HEALTH

The Two-Shift System

THE two-shift system of employment was legalised in 1920, but the trade depression has discouraged many employers from introducing it. Two shifts of eight hours each are worked between 6 A.M. and 10 P.M., so that machinery can be kept running for 88 hours a week, though no worker is employed for more than 48 hours. A report issued in 1928¹ contrasted the output, lost time, and labour turnover of the same workers employed on either system. The hourly output of the shift workers was greater, the voluntary rest pauses fewer, although, as the working hours were shorter, the output per worker was 4 per cent. less than in the ordinary system. An employer who changed from day-work with a 48-hour working week to shift-work of 82 hours might expect an increase of output per machine of over 92 per cent. There was no definite advantage in either system with regard to the sickness experienced by the workers.

At the present time 36,000 women and young persons are working in double shifts. The system has been very carefully examined by a departmental committee, particular attention being paid to the health and the social and home life of the workers. The single disadvantage, about which there has been no general complaint, is the relative lateness of certain of the meal-times. In the morning shift, for example, the midday meal cannot be taken until 2 P.M. The advantages are the shorter hours, the greater leisure during the day, and the increased opportunities of fresh air and exercise. These led the committee to the conclusion that the system did not in any way injure the health of the workers.

Moving the second reading of the Employment of Women and Young Persons Bill in the House of Commons on Dec. 17th, Mr. Geoffrey Lloyd, Under-Secretary of the Home Office, said that the Bill was to continue this scheme with certain modifications and safeguards. The rejection of the Bill was moved

by Mr. Rhys Davies because of the increasing liability of young persons to accidents at their work, due to the greater speed of working. He objected to the double-shift system on this ground and because it was contrary to the social habits of the British people. The medical aspects of the system were discussed by Dr. Howitt, who had served as an adviser on the committee. He assured the House that the system could have no adverse effect upon the health of the workers. This was the opinion of the great majority of the doctors, welfare workers, factory inspectors, and supervisors, and also of the workers themselves, not only in evidence before the committee, but also in answer to inquiries conducted in the factories. The chief medical inspector had assured them that he had not had a single complaint from any worker on a double shift about the system. The scheme eliminated the long periods of overtime which were particularly bad for women and young persons. Another advantage was the greater supervision and the higher standard of amenities which the Home Secretary demanded before he would grant an order. The workers appreciated the break in the monotony of factory work given by the shorter hours and particularly the alternate free week-ends. Mr. Hollins (Lab., Stoke-on-Trent) however was able to cite some evidence that double-shift workers suffered more than day workers from headache and respiratory diseases. After the Home Secretary had given an undertaking that the Government would appoint an advisory committee, the second reading of the Bill was carried.

HUDDESFIELD MUNICIPAL HOSPITAL.—Huddersfield health committee are proposing to build a new municipal hospital in the town which, it is estimated, will cost about £100,000.

LEITH HOSPITAL.—The managers of this hospital have issued an appeal for £60,000 for the reconstruction of its buildings. The existing medical block is to be demolished and a five-storey block erected which will contain male and female medical wards and administrative and sun-ray departments.

¹The Two-Shift System in Certain Factories. By Mary Smith and M. D. Vernon. Industrial Fatigue Research Board. Report No. 47. H.M. Stationery Office, 1928. See THE LANCET, 1928, i., 740.

MEDICAL NEWS

University of Cambridge

At recent examinations the following candidates were successful:—

THIRD EXAMINATION FOR M.B. AND B.CHIR.

Part I., Surgery, Midwifery, and Gynaecology.—L. J. Bacon, R. G. Bickford, R. A. Binning, G. L. Broderick, S. C. Buck, W. A. Burnett, R. S. Castle, E. M. Darmady, R. B. Davis, J. Diver, F. S. A. Doran, E. W. Dorrell, R. C. Droop, C. H. C. Ferguson, T. D. Fraser, I. N. Fulton, B. S. C. Gaster, M. H. Harding, E. W. Hart, F. E. S. Hatfield, C. M. Heath, A. L. Jackson, D. D. Keall, R. G. M. Keeling, J. W. Landells, D. C. Lavender, A. B. Lintott, L. N. G. Lytton, J. MacKellar, F. C. Maddox, D. N. Matthews, H. K. Meller, J. S. Minnett, T. J. Morton, B. C. M. Palmer, J. W. Parks, W. J. E. Phillips, G. C. L. Pile, J. M. Ranking, G. R. Rawlings, G. Rigby-Jones, O. N. Roussel, H. P. Ruffell Smith, R. S. Saxton, D. R. Seaton, R. H. A. Swain, W. H. Valentine, J. H. Ward, S. Ward, D. J. Watterson, A. S. Wigfield, J. R. C. Williams, H. T. H. Wilson, J. R. J. Winter, H. R. Wynne, B. J. Travers, E. H. Western, E. L. Willis, and E. M. Wright.

Part II., Principles and Practice of Physic, Pathology, and Pharmacology.—L. J. Bacon, W. M. Beattie, N. B. Betts, K. O. Black, A. C. Blandy, R. E. Bonham-Carter, F. Braithwaite, G. L. Broderick, A. F. Bryson, W. T. Cooke, E. M. Darmady, D. H. Davies, H. S. Davis, C. A. Dowling, E. D. Ewing, C. U. Gregson, G. N. St. J. Hallett, J. W. Hannay, C. Hardwick, J. R. G. Harris, A. E. M. Hartley, N. T. Holden, C. S. Humphries, H. D. Johnson, J. R. Kerr, J. W. Lacey, D. C. Lavender, J. F. Lown, K. G. F. Mackenzie, I. W. MacKichan, D. N. Matthews, S. G. Mayer, R. S. Morris, J. R. Owen, R. J. Porter, C. N. Pulvertaft, C. G. Rob, A. G. Salaman, D. S. Scott, P. G. Scott, J. A. Seymour-Jones, A. F. Stallard, F. Stansfield, W. H. Valentine, H. J. Wallace, B. L. Williams, J. R. J. Winter, M. Ball, S. L. Bhatia, E. L. Willis, and W. F. Young.

University of London

At recent examinations the following candidates were successful:—

M.S.

Branch I. (Surgery).—T. W. Mimpriss, St. Thomas's Hosp.

Branch III. (Ophthalmology).—Jean M. Dollar, Royal Free Hosp.

Branch IV. (Laryngology, Otolaryngology, and Rhinology).—W. H. Bradbeer, Guy's Hosp.

DIPLOMAS IN CLINICAL PATHOLOGY

D. H. Haler, King's Coll. Hosp. (external diploma); and A. A. Razzak, Middlesex Hosp. (academic post-graduate diploma).

University of Durham

On Dec. 21st at the College of Medicine, Newcastle, the following degrees and diplomas were conferred:—

M.B., B.S.—K. G. Scott Bavidge, F. W. Boon, M. J. Bruno, A. W. Chester, H. P. Clark, Dorothy M. Clarkson, J. Dagg, C. W. Elphick, W. A. S. Falla, S. Hurwitz, G. B. Jamieson, Jean D. McKellar, B. de F. Parris a Rosenbloom, T. A. Shaw, and M. Taws.

B.Hy.—Edna T. Everdell, Dorothy D. Nichol, and Eleanor Patterson.

D.P.H.—E. G. Brewis, Edna T. Everdell, Dorothy D. Nichol, Eleanor Patterson, and Agnes A. Schofield Russell.

L.D.S.—F. N. Hutchinson Gargett, E. M. Pickering, and W. Robson.

University of Edinburgh

On Dec. 20th the following degrees and diploma were conferred:—

M.D.—John Bennet, B. S. Bindra (in absentia), †John Douglas, E. H. Duil, †H. J. Gibson, †Israel Gordon (in absentia), †J. J. B. Martin (in absentia), H. S. E. Murray, †D. C. Osborne, †T. M. J. Stewart, J. L. Swanston, *Mary B. Walker, and John White (in absentia).

M.Ch.—†Ian Aird.

* Awarded gold medal for thesis. † Highly commended for thesis. ‡ Commended for thesis.

M.B., Ch.B.—A. F. H. Aeria, C. H. Bannerman, E. W. Q. Bannerman, E. G. Barnes, W. M. Burgess, A. P. Burnett, R. J. C. Campbell, T. M. S. Clark, A. H. Crichton, Winifred M. Dempster, Harold Ferguson, W. G. S. Harden, H. O. Howat, R. P. Jack, J. M. M. Jamieson, P. M. Kirkwood, R. K. M'All, T. A. MacGibbon, A. I. M'Kendrick, D. S. M'Kenzie, Duncan MacKenzie, K. I. E. Macleod, A. B. Milligan, T. R. N. Parhar, R. G. Parker, Isabella A. Purdie, A. S. L. Rae, A. N. Reid, R. J. S. Smith, Robert Somerville, Alfred Stern, H. H. Stott, and G. L. Walker.

D.P.H.—T. A. Don.

Dr. Mary Walker was awarded the gold medal for her thesis on myasthenia gravis, which incorporated her discovery of the action of physostigmine and prostigmin in its treatment.

Society of Apothecaries of London

At recent examinations the following candidates were successful:—

Surgery.—W. C. Heunis, Lond. Hosp.; J. M. Lea, Guy's Hosp.; and N. O. Lucas, Univ. of Oxford and Guy's Hosp.

Medicine.—C. W. Mills, St. Bart's Hosp.; J. F. O'Malley, Guy's Hosp.; and G. M. Williams, London Hosp.

Forensic Medicine.—C. W. Mills, St. Bart's Hosp.; and J. F. O'Malley, Guy's Hosp.

Midwifery.—G. K. Coombes, King's Coll. Hosp.; B. Anderson, Charing Cross Hosp.; and H. Bentovim, Univ. of Manch.

The following candidates, having completed the final examination, are granted the diploma of the society entitling them to practise medicine, surgery, and midwifery: B. Anderson, N. O. Lucas, and G. M. Williams.

Queen's University, Belfast

On Dec. 21st the following degrees were conferred:—

M.D.—J. C. C. Crawford, J. V. Hurford, and T. W. H. Weir (with commendation); and E. A. J. Byrne (in absentia).

M.B., B.Ch., B.A.O.—J. E. Morison (second class honours); F. C. Banks, J. P. Cosgrove, W. W. Davey, W. McKeown, C. C. D. Martin, B. V. McGarry, W. D. Miles, N. J. Y. Simpson, Louise Skillen, and W. McL. E. Topping.

L.D.S.—I. St. C. Alderdice and S. Hill.

University of St. Andrews

At a meeting of the court on Dec. 26th Mr. R. C. Alexander was appointed professor of surgery and Mr. R. S. Melville lecturer in clinical surgery.

Mr. Alexander was educated at the University of Edinburgh where he graduated in arts, and in 1908 obtained the degree of M.B. with honours. After further study in Paris he returned to Edinburgh, where he became a fellow of the Royal College of Surgeons in 1911, and was appointed assistant surgeon to the Chalmers Hospital. In 1921 he went to Dundee where he became surgeon to the Royal Infirmary and lecturer in clinical surgery at the University of St. Andrews. During the war he served with the British Expeditionary Force, holding rank as major in the R.A.M.C. He is a contributor to the Encyclopaedia of Medicine, and has written on the surgery of many different conditions, including cysts of the liver, adenoma of the bile-ducts, and anuria. He is an examiner in operative surgery and surgical pathology for the Royal College of Surgeons of Edinburgh, and consulting surgeon to the Memorial Cottage Hospital, St. Andrews, and the County and City of Perth Royal Infirmary.

Regulation of Warfare

An international committee of the Congress of Military Medicine and Pharmacy has for some time been considering the regulation of warfare, and a conference to discuss the subject will meet at Monaco from Feb. 10th to 12th. Prof. Dehousse, of Liège, will describe the present state of the law towards war, especially as regards the protection of the civilian population, and Dr. Voncken, director of the Office International de Documentation de Médecine Militaire, will discuss ambulance services in the war of the future. The third purpose of the meeting will be the establishment of an Association Universelle pour la Protection Internationale de l'Humanité. Further information may be had from Dr. Voncken, Quai de Plaisance, Monaco.

Conference on Mental Health

The National Council for Mental Hygiene is holding its fourth biennial conference on mental health at the Central Hall, Westminster, from Jan. 23rd to 25th. The Duke of Kent, president of the council, will open the conference and will take the chair at the first session when Lord Allen of Hurtwood and Dr. William Brown will discuss mental hygiene and international relations. Other subjects and speakers which have been announced are: the organisation and correlation of mental health services in local areas (Prof. R. M. F. Picken and Dr. T. Saxty Good); problems of marriage and the establishment of courts of domestic relations (Dr. Helen Boyle); and the priest and the doctor in the treatment of nervous and mental disorders (Dr. H. Crichton-Miller). There will be a symposium on education for living, comprising mental health, those first eight years (Dr. R. G. Gordon, Dr. Maria Montessori); "moulding" the mind, eight to fourteen (Dr. Emanuel Miller); and the "finished" product, fourteen onwards. The secretary of the council may be addressed at 78, Chandos House, Palmer-street, London, S.W.1.

Royal Institution of Great Britain

On Jan. 31st the Friday evening discourse will be given at 9 P.M. by Prof. Edward Mellanby, F.R.S., who will speak on recent advances in the treatment of disease. On March 10th, 17th, 24th, and 31st, at 5.15 P.M., he will give a series of lectures on drug-like actions of some foods. The address of the institution is 21, Albemarle-street, London, W.1.

Lectures on Industrial Law

The Industrial Welfare Society is arranging a course of lectures which will give those interested in administrative work in industry and commerce a practical knowledge of the branches of the law which they will need. The lectures will be given by Mr. H. Samuels on Wednesdays from Jan. 22nd at the headquarters of the society, 14, Hobart-place, Westminster, S.W., at 6.30 P.M.

British Ambulance Unit in Abyssinia

This unit, which was originally planned for work in the Ogaden, has, at the express wish of the Emperor, now gone to Dessie. It thus becomes the chief Red Cross unit for the northern armies in Abyssinia. This change has incurred heavy additional expenditure. Donations may be sent to Sir Arthur Stanley, British Red Cross Society, 14, Grosvenor-crescent, London, S.W.1, or to the hon. treasurer of the British Ambulance Service in Ethiopia (Mr. A. W. Tuke), Barclays Bank, 54, Lombard-street, E.C.2.

Fellowship of Medicine and Post-Graduate Medical Association

The following all-day courses will be available during the first two months of this year: cardiology at the National Hospital for Diseases of the Heart (Jan. 13th to 24th); proctology at St. Mark's Hospital (Feb. 3rd to 8th); gynaecology at the Chelsea Hospital for Women (Feb. 10th to 22nd). Week-end courses will be held in heart and lung diseases at the Royal Chest Hospital (Jan. 18th and 19th); in physical medicine at the St. John Clinic and Institute of Physical Medicine (Feb. 8th and 9th); in children's diseases, Princess Elizabeth of York Hospital (Feb. 22nd and 23rd). On Tuesdays and Thursdays at 8.30 P.M., from Jan. 14th to March 5th, surgical tutorial classes (specially suitable for F.R.C.S. candidates) will be given at the National Temperance Hospital, and an evening course in anatomy and physiology (in preparation for the primary F.R.C.S. examination) from Feb. 24th to April 24th, at the Infants Hospital, Vincent-square, S.W. Further information may be had from the secretary of the Fellowship at 1, Wimpole-street, W.1.

Appointments

LANGLEY, G. F., Ch.M. Brist., F.R.C.S. Eng., has been appointed Senior Resident Medical Officer at the East Suffolk and Ipswich Hospital.

MACIVER, DONALD, M.D. Edin., D.P.H., Medical Officer of Health to Walton and Weybridge Urban, and Bagshot Rural, Councils.

Hospital for Epilepsy and Paralysis, Maida Vale.—The following appointments are announced:—

ELKINGTON, J. ST. CLAIR, M.D. Camb., F.R.C.P. Lond., Second Honorary Assistant Physician;

NEVIN, S., M.D. Belf., M.R.C.P. Lond., Third Honorary Assistant Physician; and

MCKISSOCK, WYLIE, M.S. Lond., F.R.C.S. Eng., Honorary Assistant Surgeon.

London County Council Hospital Staff.—The following appointments and transfers are announced: A.M.O. (II.) = Assistant Medical Officer, Grade II:—

DONALD, A. B., M.B. Aberd., A.M.O. (II.), North Western;

LEWIS, J. T. R., M.B., D.P.H., A.M.O. (II.), South Western;

PICTON, W. H. A., B.M. Oxon., A.M.O. (II.), Park;

CAMPBELL, R. M., M.B. Aberd., A.M.O. (II.), Grove;

JAMES, M. F., M.B., A.M.O. (II.), Brook;

GIBSON, M. O., M.B. Glasg., D.P.H., A.M.O. (II.), North Western;

CARDWELL, E., L.R.C.P. Edin., A.M.O. (II.), Southern;

LIDDELL, V. L., M.B., A.M.O. (II.), Western;

BATEMAN, L. L., M.B., A.M.O. (II.), Northern; and

WILSON, E. M. R., M.B., A.M.O. (II.), South Western.

Vacancies

For further information refer to the advertisement columns

- Birmingham City Mental Hospital.*—Jun. Asst. M.O. £350.
Birmingham and Midland Eye Hospital.—Res. Surg. O. £200.
Birmingham, Selly Oak Hospital.—Jun. M.O.'s. Each at rate of £200.
Birmingham, St. Chad's Hospital.—Jun. Res. M.O. At rate of £150.
Birmingham United Hospital.—Bacteriologist and Clin. Pathologist. £500.
Bolingbroke Hospital, Wandsworth Common, S.W.—H.P. At rate of £120.
Charing Cross Hospital, W.C.—Hon. Anaesthetist.
Chichester, Royal West Sussex Hospital.—Jun. H.S. At rate of £125.
Connaught Hospital, Walthamstow, E.—Cas. O. £100.
C Coventry and Warwickshire Hospital.—H.S. to Aural and Ophth. Depts. At rate of £125.
Croydon Mental Hospital, Upper Warringham.—Asst. M.O. £350.
Doncaster Royal Infirmary.—H.S. £175.
Eastbourne, Royal Eye Hospital, Pevensey-road.—H.S. £100.
Glasgow Royal Mental Hospital, Gartravel.—Asst. Physician. £300.
Halifax Hospital for Infectious Diseases.—Res. M.O. £350.
Hampshire County Council.—Asst. County M.O.H., &c. £800.
Hove General Hospital.—Hon. Physio-therapist.
Huddersfield County Borough.—Asst. School M.O. £500.
Hull Royal Infirmary.—Cas. O. At rate of £150.
Ilford Council Maternity Home.—Res. M.O. £350.
Institute of Ray Therapy and Electrotherapy, 152, Camden-road, N.W.—Part-time M.O. At rate of £100.
Isleworth, West Middlesex County Hospital.—Res. Anaesthetist. £400. Also Cas. M.O. £350.
Kettering and District General Hospital.—Second Res. M.O. At rate of £125.
Leeds General Infirmary.—Res. Aural Officer. £149.
Liverpool, David Lewis Northern Hospital.—Cas. O. At rate of £120. Also four H.S.'s and two H.P.'s. Each at rate of £80.
Liverpool, Mill-road Infirmary.—Res. Deputy Med. Supt. £150.
Liverpool, Royal Children's Hospital.—Two Res. Phy.'s and two Res. Surg.'s, for City Branch, Myrtle-street. Also Res. M.O. and Res. Surg. O. for Heswall Branch.
Liverpool Royal Infirmary.—Sen. Cas. O. At rate of £120. Also Jun. Cas. O. and H.S. to Skin Dept. At rate of £60.
London Hospital, E.—Med. 1st Asst. and Reg. £300. Also Asst. in X Ray Dept. £100.
London Jewish Hospital, Stepney Green, E.—Out-patient Asst. £125.
London Skin Hospital, Fitzroy-square, W.—Hon. Asst. Physician.
London University.—Readership in Surgery, £800-£1000.
Manchester, Ancoats Hospital.—Res. Surg. O. £200.
Manchester, Booth Hall Hospital for Children.—Res. Jun. Asst. M.O. £200.
Manchester Royal Infirmary.—Four H.S.'s, H.S. to Aural, Gyn., and Ophth. Depts., H.S. to Neurosurgical Dept., H.S. to Orthopaedic Dept. Also four H.P.'s. All at rate of £50.
Metropolitan Hospital, Kingsland-road, E.—Res. Cas. O. £100.
Newcastle General Hospital.—Two H.S.'s and two H.P.'s. Each at rate of £150.
Newcastle-upon-Tyne, Barrasford Sanatorium.—Res. Med. Asst. £250.
Newcastle-upon-Tyne, Hospital for Sick Children.—Res. Surg. O. £250. Also H.P. and H.S. Each at rate of £100.
Nottingham General Hospital.—H.S. At rate of £150.
Princess Louise Kensington Hospital for Children, St. Quintin-avenue, W.—Clin. Asst.
Putney Hospital, Lower Common, S.W.—Jun. M.O. At rate of £100.
Queen's Hospital for Children, Hackney-road, E.—Three Anaesthetists. One guinea per attendance.
Rochdale Infirmary and Dispensary.—Sen. H.S. £250.
Royal Masonic Hospital, Raenscourt Park, W.—Surgeon.
St. Bartholomew's Hospital, E.C.—Asst. Physician. Also Asst. Physician and Asst. Director to Medical Professorial Clinic.
St. Mary's Hospital, W.—Cas. H.S. At rate of £100.
South London Hospital for Women, Clapham Common, S.W.—Out-patient M.O. £100.
Stirling District Mental Hospital, Larbert.—Third Asst. M.O. £250.
Stoke-on-Trent, Longton Hospital.—H.S. £160.
Swansea General and Eye Hospital.—Cas. O. At rate of £150-£175. Also H.P. and H.S. Each at rate of £150.
Victoria Hospital for Children, Tile-street, Chelsea, S.W.—Cas. O. At rate of £200. Also H.P. and H.S. Each at rate of £100.
Walsall General Hospital.—H.S. At rate of £150.
Warrington County Borough.—Asst. M.O.H. £450.
Warrington, County Mental Hospital, Winwick.—Asst. M.O. £500.
West End Hospital for Nervous Diseases, Gloucester-gate, N.W.—Res. H.P. £125.
West End Hospital for Nervous Diseases, Welbeck-street, W.—Hon. Clin. Asst. to Out-patient Clinic.
Willesden Borough.—Anaesthetist. Also Throat, Nose, and Ear Surgeon. Each £2 12s. 6d. per session.
Worksop, Victoria Hospital.—Sen. and Jun. Resident. At rate of £150 and £120 respectively.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Mochrum (Wigtown), Stanley (Perth), and Cheltenham (Gloucester).

NEW YEAR HONOURS

THE list of honours issued on Wednesday contains the names of the following members of the medical profession :—

K.C.V.O.

Louis Francis Roebuck Knuthsen, C.V.O., O.B.E., M.D.
Physician-in-ordinary to the Princess Royal; consulting physician to the London Skin Hospital.

Knights Bachelor

Colonel Charles Isherwood Brierley, C.I.E., M.R.C.S., I.M.S. (retd.)

Lately inspector-general of civil hospitals and jails, North-West Frontier Province.

Hugh Berchmans Devine, M.S.

Vice-president of the Royal Australasian College of Surgeons.

Mangaldas Vijbhucandas Mehta, O.B.E., F.R.C.P.I.
Medical practitioner, Bombay.

David Percival Dalbreck Wilkie, O.B.E., F.R.C.S.
Professor of surgery in the University of Edinburgh.

C.B. (Military)

Major-General F. G. FitzGerald, D.S.O., L.R.C.P.I.
Deputy director of medical services, Eastern Command.

C.M.G.

Rupert Briercliffe, O.B.E., M.R.C.P.
Director of medical services, Ceylon.

Colonel Arthur Murray Cudmore, F.R.C.S.
Surgeon to Adelaide Hospital; consulting surgeon of the Australian Army Medical Corps Reserve.

C.I.E.

Major R. S. Aspinall, F.R.C.S.E., I.M.S.
Civil surgeon, Ajmer-Merwara and chief medical officer, Rajputana.

James Cairns, O.B.E., M.D.
Chief medical officer, North-Western Railway, Punjab.

Lieut.-Colonel W. R. Stewart, F.R.C.S.E., I.M.S.
Surgeon to the Viceroy of India.

C.V.O.

William Gilliatt, F.R.C.S.
Obstetrical and gynaecological surgeon to King's College Hospital, London.

Howell Gwynne-Jones, M.R.C.S.
(Dated Dec. 12th, 1935).

C.B.E.

Lieut.-Colonel A. M. Dick, O.B.E., F.R.C.S., I.M.S.
Professor of ophthalmology in the King Edward Medical College, Lahore.

O.B.E. (Military)

Surgeon-Commander F. G. Hitch, M.B., R.N.

O.B.E. (Civil)

William Kenneth Bigger, M.C., M.R.C.S.
Senior medical officer, Palestine.

Cyril Charles Herbert Cuff, F.R.C.S.E.
Surgical specialist, Cyprus.

Robert William Dodgson, M.R.C.P.
Director of shellfish services, Ministry of Agriculture.

John Griffiths, M.R.C.S., D.P.H.
Medical officer of the Neath rural district council.

John Hutson, M.B.E., M.B.
Of Barbados.

Robert Jamison, F.R.C.S.
Principal medical officer, Swaziland.

William Brownlow Ashe Moore, L.R.C.P.I.
Deputy director of medical services, Hong-Kong.

Mrs. Mary Josephine Were, L.R.C.P.I.
Lady medical officer, Federated Malay States.

M.B.E.

Robert McLean Gibson, F.R.C.S.E.
Of Hong-Kong.

Rai Sahib Achhru Ram.
Civil surgeon, Uganda.

Kaikhusro Sorabji Sethna, L.M. and S.
Health officer of the Delhi municipality.

Miss Janet Welch, M.B.
Medical officer, Church of Scotland Mission Hospital, Blantyre, Nyasaland.

Hon. M.B.E.

Fuad Dajani, M.R.C.S.

Kaisar-i-Hind Medal

Ramkrishna Narayan Parmanand, L.M. and S.
Chief medical officer, Adams Wylie Memorial Hospital, Bombay.

Births, Marriages, and Deaths

BIRTHS

ABDULLAH.—On Dec. 7th, the wife of Dr. A. D. Abdullah, of a son.
FISHER.—On Dec. 24th, at Abingdon, Berks, the wife of Dr. John Fisher, of a son.
KIDD.—On Dec. 27th, the wife of H. A. Kidd, F.R.C.S. Edin., of a daughter.
MULHOLLAND.—On Dec. 22nd, at Whimble, Devon, the wife of H. H. Mulholland, M.B. Belf., of a daughter.
PARKINSON.—On Dec. 24th, the wife of Ellis Parkinson, M.B. Birm., of Wyke Regis, Weymouth, of a son.
STARRIE.—On Dec. 24th, at Devonshire-place, W., the wife of E. T. W. Starkie, M.A., B.Chir., of Creaton Sanatorium, Northants, of a daughter.

MARRIAGES

GREENWAY—STRIDE.—On Dec. 21st, at Eastergate Parish Church, Dr. Geoffrey Hudson Greenway to Peggy, younger daughter of the late Mr. F. Stride of Barnham, Sussex.

DEATHS

ALLEN.—On Dec. 28th, at Oulton Heath, Stone, Maria Shepherd Allen, L.R.C.P. Edin., aged 58.
ARUNDEL.—On Dec. 28th, at Wrecclesham, Farnham, Robert James Arundel, M.D. Dub., Capt., R.A.M.C., ret'd.
BALLARD.—On Dec. 23rd, at Shepherdswell, Dover, Philip Ballard, M.R.C.S. Eng., late of Smarden, Kent, in his 81st year.
COTTON.—On Dec. 23rd, at Sheffield, Robert Hugh Cotton, M.R.C.S. Eng., in his 55th year.
DANIEL.—On Dec. 25th, at Ealing, Robert Napier Daniel, M.R.C.S. Eng., aged 69.
GILES.—On Dec. 26th, at Welwyn, Herts, Arthur E. Giles, M.D. Lond., F.R.C.S. Edin., aged 71.
GORDON-WATSON.—On Dec. 21st, 1935, Alice Geraldine Mary, dearly loved wife of Sir Charles Gordon-Watson, of 82, Harley-street, W.1, after a long and painful illness, most bravely borne.
HEWETT.—On Dec. 27th, at The Wilderness, Hampton Hill, Lieut.-Col. Augustus Hewett, F.R.C.S. Edin. (late R.A.M.C.), aged 82.
HOWELL.—On Dec. 21st, at Middlesbrough, Robert Edward Howell, M.B. Edin., aged 70.
MATTHEWS.—On Dec. 28th, at a Brighton nursing-home, Gladys Matthews, M.R.C.S. Eng., late of the C.M.S., Punjab, India.
PERCIVAL.—On Dec. 22nd, at Shenley, Woking, Archibald Stanley Percival, M.A. Durh., M.A., M.B. Camb.
SINCLAIR.—On Dec. 23rd, at 25, Elvaston-place, S.W.7, James Edward Sinclair, L.R.C.P. Edin., formerly of Queen Anne's-gate, and Wyndham House, Aldeburgh.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

ROYAL SANITARY INSTITUTE.—Recent developments in sewage treatment and disposal at the London County Council works will be the subject of a paper to be read by Mr. J. H. Coste, the chief chemist of the Council, at a sessional meeting of this institute (90, Buckingham Palace-road, London, S.W.), to be held on Tuesday, Jan. 14th, at 5.30 p.m.

NOTES, COMMENTS, AND ABSTRACTS

PUBLIC HEALTH IN INDIA *

RETROSPECT AND PROSPECT

BY Major-General Sir JOHN MEGAW, K.C.I.E.,
D.Sc., M.B. R.U.I.

MEDICAL ADVISER TO THE SECRETARY OF STATE FOR INDIA; LATE
DIRECTOR-GENERAL OF THE INDIAN MEDICAL SERVICE

Retrospect

IN ancient times certain ceremonials and customs pointed to the interest taken in hygiene by certain classes of Indians. Eugenics have played an important part in the life of the Brahmins for many centuries. Yet for India as a whole, throughout the ages the one and only health officer has been Nature, whose methods have been excessive reproduction counteracted by disease and famine. Man has added his special checks to population in the form of war and infanticide.

Little is known about the population of India in ancient times. One authority estimates that it was 80 millions in 1850 and 130 millions in 1750, while Sir Frederick Nicholson thinks it was only about 100 millions in 1800. Probably for thousands of years before 1700 the population showed mighty fluctuations between the figures of 30 millions and 100 millions.

Two new factors were introduced by Western influences and the spread of education. (1) The effort to prevent deaths from disease and famine. (2) The increase in production of crops and commodities combined with improved distribution. Under these influences the population increased rapidly and, up to a point, the economic condition of the people improved. Great differences of opinion exist as to whether or not the people are now better off than they were 50 years ago, but the really important matter is their present condition and their future prospects. One basic principle is and will always remain the same: good standards of health and well-being cannot be maintained if the numbers of the people are excessive in comparison with the food-supply.

So far as the controlled populations are concerned splendid results have been achieved by officers of the I.M.S. and R.A.M.C., as can be seen from these figures.

Death-rates

	British troops.	Indian troops.	Prisoners.
1859	69.0	20.0	100.0
1875	20.0	20.0	
1900	13.0	11.0	35.0
1912	4.62	4.4	
1933	2.44	2.39	11.2

In the uncontrolled population similar results have not been possible for obvious reasons. The original policy of the Government of India after control had been taken over by the Crown about 1860 was to avoid imposing any restrictions which might arouse opposition among the people, but instead to popularise modern medicine by opening hospitals and medical schools. By this means combined with the spread of general education it was hoped to create a spirit of goodwill towards preventive medicine. Besides, the total revenues of the Governments of India would have been insufficient to set up a modern public health machinery. Hence attention was concentrated chiefly on vaccination, the provision of water-supplies, and drainage systems.

* An abstract of two lectures given under the auspices of London University at the London School of Hygiene and Tropical Medicine on Dec. 4th and 6th. In a previous lecture some of the basic principles of public health had been discussed.

Medical research has been actively pursued in India and has done excellent work; it was established on an organised basis long before the Medical Research Council was created in England. If preventive medicine had been developed on advanced lines and had achieved complete success, the population of India would probably be 500 millions instead of 370 millions. Where would so many people find adequate food if the present population is already badly nourished?

RESULTS OF A SURVEY

I carried out a survey about four years ago by means of a questionnaire issued to 571 Indian doctors in dispensaries situated in typical agricultural villages throughout India. An analysis of the replies gave the following results. Under 40 per cent. of the people were considered to be well nourished, while over 40 per cent. were regarded as poorly nourished, and 20 per cent. very badly nourished. Few people had suffered from actual hunger during the previous five years but the evidence pointed to serious defects in the quality of the food, especially in the matter of high-grade proteins, fats, and vitamins. The average quantity of milk consumed daily by each person in India was about three and a half ounces. Butter in the form of ghee was taken to the extent of one-third of an ounce daily.

The number of cases of the following diseases at the time of the survey was:—

	Millions.		Millions.
Rickets	2½	Night-blindness ..	3½
Syphilis	5½	Gonorrhœa	7½
Leprosy	½	Tuberculosis of the lung	1½
Other forms of tuberculosis	½	Insanity	½
Congenital mental defects	½	Blindness	2

In the cases of leprosy and blindness the figures are much higher than those shown by the census, but are more likely to be accurate. About 15 per cent. of the school-children had enlarged spleens. The average age at which girls begin to cohabit with their husbands is 14, and the average age of the mothers at the birth of their first child is 16. The maternal mortality-rate works out at about 30 per mille against about 5 per mille in England. Something like ten out of every hundred girl wives are doomed to die in childbirth before they cease to have babies.

These data are not claimed to have statistical accuracy as they are obtained by the process of random sampling and the personal equation enters into the replies but they are claimed to give a true general impression of the real state of affairs in the Indian villages, which of course represent the real India. Whether this rough-and-ready survey is accepted as being reasonably accurate or as being unreliable, it follows that there is an urgent need for a careful investigation of the situation.

OTHER EVIDENCE

The recent official reports show that the birth-rate in India remains constantly high, being about 34 per mille, while the death-rate shows a tendency to decline, being 22 per mille against an average of about 34 between 1901 and 1920. These figures suggest that a very satisfactory degree of improvement is taking place in health conditions, but on the other hand the population is increasing at the rate of 3½ millions yearly in British India alone. It is estimated by Colonel A. J. H. Russell, public health commissioner with the Government of India, that the population of the whole of India, including Burma, will be about 400 millions by 1941. These figures raise the momentous question, will the food-supply be enough to nourish so many people? From the survey which has been described above, it appears that the people must be living very close to the line which separates a bare subsistence from starvation.

Prospect

Prophecy is notoriously unsafe, but a forecast of the future is essential if we are to escape from those disasters which give warning of their approach. Even if the present food-supply were regarded as adequate, provision would have to be made for a 10 per cent. increase during the next ten years. If public health were to bring about a further modest reduction in the death-rate, this increase in the food-supply would have to be about 20 per cent. instead of 10 per cent. It is also reasonable to suppose that an immediate increase of about 20 to 30 per cent. may be found necessary to provide for a proper state of nutrition of the existing population, and to this would be added the recurring increase of about 20 per cent. every ten years to feed the increasing number of mouths. Here is a stupendous task for those who are responsible for the welfare of India. The optimists suggest that the one and only thing needful is to lower the death-rate; they hold that the birth-rate will automatically adjust itself; but in India this is not happening, for, while the death-rate has fallen from about 34 per mille, which was the figure before 1920 to 22 per mille during the years 1932 and 1933, the birth-rate has maintained a steady average of about 34 to 35 during the past few years and shown only a slight decline since the beginning of the present century. Better conditions of life can be secured in India by increasing the production of food and other commodities, by improving the distribution of these, and by diminishing the appalling waste which goes on; but these measures must fail if the increase in the population is more rapid than the increase in the available supply of commodities. If the growth of population continues to occur at the present rate, and the increase in the food-supply is not greatly stimulated, the available surplus must gradually dwindle away till there will be no money to spend on education, medical relief, public health, police, railway travel, commerce, &c., and the country must lapse into barbarism. Nature will then resume her sway and once more there will be a wildly fluctuating balance between population and food-supply. This balance will be struck at a much lower average level, probably at something like half of the present population.

Sceptics will ask: "Do such things happen? Are these not the predictions of scaremongers?" The following two examples are given, one to show what has happened in the past and another to show what is actually happening at present. In Ireland the population increased from one and a quarter millions in 1700 to 4½ millions in 1800, and again to more than 8 millions in 1841 when the people were living in conditions far worse than those of the Indian peasant to-day. Then famine, disease, and emigration caused a ruthless reduction in the numbers of the people, and now only about 4 millions can live in a modest standard of comfort. The present low figure is only retained by extensive celibacy and by greatly delayed marriage; no less than 80 per cent. of the males between 25 and 30 remain unmarried. In the case of Japan, where the population has doubled itself in the past 50 years, and where, despite industrial expansion and strenuous efforts in disease prevention, the death-rate is almost the same as in 1890, whereas it has fallen in England by nearly 50 per cent. during the same period. The infant mortality-rate has risen considerably since 1890 in Japan, while it has fallen in England to a good deal less than half the figure of 1890. A significant point is that the birth-rate in Japan has risen appreciably and is over 30 per mille, whereas in England it has fallen from 31·4 in 1890 to less than half. These figures seem to show that public health actually does fail to achieve success while the population is growing at an excessive rate. If India were able to emulate Japan in the thoroughness of her measures for disease prevention, she could only expect to achieve the same results unless she provided a check to the rapid growth of the population.

WANTED, A PLAN

My aim has been to demonstrate that there is reason for grave anxiety about the present condition of the people of India, and still greater reason for alarm about the future so that a searching inquiry is obviously needed. But some people have no faith in inquiries. They agree that the people of India would resent any suggestion of interference with their customs and religions, and it becomes necessary to convince them that a useful purpose will be served by an investigation such as I have suggested. There can be no doubt as to the practicability of plans for increasing production and for preventing disease, these being two of the limbs of the tripod on which rests the welfare of India; the real doubts are about the third limb, which is the regulation of the population. Contrary to the usual belief, educated Indians are willing and even eager to consider any means of dealing with the evil of over-population. The chief prejudice is encountered among Europeans who wrongly imagine that Indians are antagonistic to any suggestion for reform of their ancient customs. Examples might be given to show the attitude of some western officials and even public health workers who refused to believe that there was any need for intervention or that intervention could serve any useful purpose. On the other hand, many British medical officers and laymen have called attention to the urgency of the situation. The medical research workers, for instance, at their annual conferences in 1923, 1924, 1925, and 1926 unanimously adopted a resolution framed by the writer, in collaboration with the late Major-General Hutchinson, I.M.S., in which the Government of India was appealed to for the appointment of a strong commission, chiefly non-technical, to make a thorough inquiry into the wastage of life and the economic depression.

In the report of the Royal Commission on Agriculture published in 1928 it was pointed out that "it is the duty of Government to investigate basic medical problems and to enunciate and direct sound principles of public health administration," also that "the rural problem should be attacked as a whole and at all points simultaneously." In the concluding chapter these words appear: "the demand for a better life can, in our opinion, be stimulated only by deliberate and concerted effort to improve the general condition of the country side, and we have no hesitation in affirming that the responsibility for initiating the steps required to effect this improvement rests with Government." These weighty words have an added significance as representing the views of the Viceroy Designate. Views of Sir George Newman, Mr. J. H. Hutton, D.Sc., I.C.S., Lieut.-Colonel A. J. H. Russell, Mr. Stanley Baldwin, and Lord Eustace Percy might also be quoted, showing that all these recognised the great urgency of the combined economic, population, and health problem in India.

In his recent presidential address, Sir Gowland Hopkins stressed the need for a comprehensive food policy for England. I cordially agree that a food policy for England is needed. Much more urgent is the need for such a policy in India where it is not merely a question of improving unsatisfactory conditions but of saving the country from a relapse into barbarism. Educated Indian opinion is unanimous in recognising the need for reform: even the educated women are most outspoken in their demand for immediate action to lessen the strain on the bodies and minds of Indian girls who are compelled to endure matrimony at an age when English girls are enjoying a happy childhood.

NATURE OF THE PLAN

Assuming that the proposed committee of inquiry are to find it necessary to prepare a plan, it is suggested that the most effective means of dealing with the situation will be found to consist in education. There are various methods of conveying instruction, but chief reliance will probably be placed

on an India-wide scheme of broadcasting. By this means the whole population, including the women, can be informed of the hard facts of the situation and of the steps which have been taken by other countries to secure comfortable standards of life. In this way they would come to realise the need for a new outlook on life.

There is no need for pessimism, provided that immediate and adequate steps are taken. There are vast possibilities of greatly increasing the production of food and of eliminating waste, such as the maintenance of 25 million useless cattle. The finances of India are in a sound condition, the burden of taxation very light, and the country is free from the anxiety which rests on nations which are highly industrial and therefore dependent on the caprices of world commerce. A concerted national effort such as has been made recently in England would bring prosperity to India, but this would be of short duration unless the people acquire a new outlook on life.

NURSING IN RUSSIA

WE have published from time to time notes on the new Russia from the pens of medical authors. A racy account of the impressions of one of the first party of nurses to pay a professional visit to the Soviet Union, which originally appeared in the *Nursing Times* and has now been reprinted in pamphlet form, records observations from a different angle. The party—all members of the College of Nursing—seem to have used their "nurse's eyes and ears, to note the little significances" to good purpose; for example, they kept a sharp look-out for rickets and impetigo, the total count throughout the trip being only some three or four cases of each. Certain characteristics of Russian nursing emerged: (1) matrons' posts as understood here, with all their responsibilities, are unknown; (2) nurses are divided into two classes, "medical sisters," and "nurses" or orderlies; (3) such refinements as screens and sluice rooms, mops, and scrubbing brushes are not taken as seriously as in this country.

The party visited by appointment the Institute of First Aid, Leningrad, containing 200 beds and specialising in acute abdominal cases. The preliminary interview with the doctors—the matron, if she existed, was not brought forward—revealed that the hospital undertakes research work in acute abdominal cases and compiles mortality and morbidity statistics for general reference. Its findings as to the best time to operate on an acute appendix, for example, are promulgated all over the Union. It is called a "first aid station" because it is open night and day and takes in the accidents and emergencies of the district it serves. It has no out-patient department as such. If a worker in the district falls ill he telephones to the hospital doctor to come and visit him in his home, and if he requires hospital treatment—there is not much home nursing in Russia—he is brought in the ambulance. All workers are made thoroughly aware of the medical facilities in their neighbourhood. As working hours are short in Russia, and hardly any of the doctors or nurses live in, the staff is large. This hospital of 200 beds employed 20 doctors, 30 "medical sisters," and 16 auxiliaries called "nurses." There is no distinguishing uniform. Everybody ties a starchless overall over their outdoor clothes, and a limp white handkerchief over their hair, and everybody wears list slippers (with or without stockings), the slippers often being secured by tape. The medical sisters work six hours a day and the nurses eight. There was at one time a shortage of nurses, but the position is rapidly improving.

The informality in the wards was the subject of comment. The wards in Russian hospitals are small—at most ten-bedded, many two- and four-bedded—and the beds are much lower and closer together than in our hospitals. Visitors are allowed twice in every six days. All the patients have ear-

phones, and all seemed to be reading something. On the stairs between each floor is a sort of letter box in which are collected the patients' personal notes to their friends. These boxes are cleared twice a day; friends call for the notes at the entrance and leave their own replies. They can ring up any time between 10 A.M. and 7 P.M. for news of the patients, and there is one hour in the morning during which they can interview the doctors. The hospital provides nine different diets.

Not only at the Institute of First Aid but at the Lenin Hospital, Leningrad (500 beds, 1000 out-patients, ex-patients only, daily) the visiting nurses were interested by the complete absence of screens, and by the elaborate arrangements for assuring that successive batches of nurses were kept informed of the patients' progress and special needs. As there is a good deal of changing of duty, particulars of really ill patients are written on small squares of frosted glass and slipped in front of a viewing screen on the sister's table. There they are lit up like a series of X ray plates. Changes of treatment are put on cards, a card for each patient, and slipped into the slots of an "album"—just as if they were a collection of picture postcards.

A "wall newspaper" is to be found in every hospital. On it one sees photographs of workers, and also articles of general interest, often of self-criticism. One whole sheet may be devoted to a department which has done poor work, or whose staff have grown slack.

The information sought and gained was not all in one direction. The Russian doctors asked pertinent questions of the British nurses; for instance:—

"We understand that, unlike our nurses, very few of you are married, and we think it so strange. Speaking as doctors we would even go so far as to say that it is a physiological crime. We hope you do not think us rude to say so." "Not at all," we replied amiably. "But we work longer hours than you and have little time for marriage if it has to be combined with hospital work. Quite a lot of our nurses do marry, but they are expected to give up nursing then. Anyway, do tell us if you think we look ill or strained." Well, they had to admit that we did not, but as we left, with a mutual exchange of smiles and bows, the faint murmur of "physiological crime" pursued us to the very gates.

It had previously been ascertained that besides the annual holiday of two or three weeks, "medical sisters" were allowed four months' pregnancy leave, two months before and two after childbirth. Many other interesting differences of custom were observed and are here entertainingly recorded.

HAMLET ANALYSED AGAIN

THAT artists who concern themselves with character study may on occasion be more trustworthy guides to problems of psychology than professional psychologists is a thesis well worth discussing. Inevitably Shakespeare, whose intuition provides a veritable index to human character, must loom large in such an argument. Now that psychology endeavours not merely to dissect but to coördinate character, it cannot afford to ignore one whose words appear to stimulate each succeeding generation to fresh interpretation.

Dr. Brock, in a little book recently published,¹ enumerates the theory first that Hamlet's "overgrowth of some complexion," of which he was well aware, was passion, secondly, that Hamlet constitutes Shakespeare's portrait of himself. The latter is, of course, only arguable in a limited sense. At some time in his life Shakespeare must have actually experienced the pangs that wrung all his great creations. If Hamlet was indeed Shakespeare in one phase of his life, he passed from that particular phase to others in which idealism gave way to cynicism, as in Antony, Coriolanus, and Timon, and

¹ The Dramatic Purpose of Hamlet. By J. H. E. Brock, M.D., B.S., D.P.H., F.R.C.S. Cambridge: W. Heffer and Sons, Ltd. Pp. 48. 2s. 6d.

gradually thereafter became philosophy as illustrated in the last plays.

Did Hamlet know that his passions would be likely to ensnare him? This interpretation certainly has no support from Bradley; the picture of the final prevailing of passion as a resultant of two opposing forces—the meaner wish for revenge and the higher restraint of idealism—is one well in accord with actual experience. When, however, Dr. Brock takes the dying words of Hamlet to be a cry of despair, we must remember that the excellent Horatio evidently did not interpret them thus. As to the ghost, the old saying "De mortuis nil nisi bonum" has lost its mandatory force among modern commentators. Dr. Brock concludes that old Hamlet had probably been an egotistical bore in the flesh, and though Hamlet naturally idealised his father, other eyes may have perceived some excuse for his wretched queen.

THE HOSPITAL ALMONER

"Go and ask the lady almoner about that. She will be able to help you." This remark may be heard over and over again in any out-patient department when apparently insuperable obstacles are raised by the patient to a line of treatment deemed essential. And to the lady almoner they go, poor, harassed and worried, mental anxiety contributing its full weight to physical illness, and so interwoven with it that it is impossible to cope successfully with either alone. The new edition¹ of "The Hospital Almoner" shows the variety of ways in which the lady almoner is able to solve problems which to the uninitiated might appear hopeless, and the agencies, State or voluntary, which can be tapped; while for intending candidates there has been added a new and helpful chapter which contains useful practical details of the course of training, of previous qualifications essential and valuable, and of the scope of their future work. The book is essentially practical, like the almoner's activities, and it has been compiled with sympathetic insight based on knowledge of the psychological as well as the material aspects of the fine social service it describes.

It is of interest to compare with this general survey this year's annual report of the Social Service Department of St. Thomas's Hospital, whose almoner's department is world-famous. It tells the story of the varying aspects of the work at St. Thomas's, from the struggle to get the slums of Lambeth removed, to the difficult task of finding money for the many activities of the department. On the financial side, it is interesting to note that patients' donations make up about 10 per cent. of the hospital income, and that the average cost of maintaining a patient at St. Thomas's is about 13s. per day. Interesting too are the sections on the special departments and on the variety and scope of convalescent work undertaken. The co-operation between the voluntary hospitals and the public authorities is a development which has grown rapidly of recent years. A helpful supplement to the work of both the maternity and the children's department is the "Father's and Mother's" centre, which has an educative value far beyond any centre which caters only for one parent.

HYGIENE IN THE SCHOOL

THE movement for the teaching of hygiene as well as biology in schools has created a demand for elementary text-books which publishers have been alert to satisfy. Dr. Gamlin has written a book² intended for teachers in training, for student health visitors, and as a book of reference for school teachers wishing to bring their knowledge of hygiene up to date. It covers a wider range than would be anticipated from its title. Such subjects as heredity,

ductless glands, the welfare of infants and young children, air, ventilation, sunlight, personal hygiene, food, beverages, alcohol, infection and immunity, infectious diseases, tuberculosis, rheumatism, and chorea are dealt with as well as school hygiene. The exposition is clear, the information accurate, and emphasis is properly placed.

Dr. Lyster's book³ is intended to be used in connexion with the class instruction of junior pupils in hygiene. New features in the second edition include a guide to the pronunciation of scientific terms and a revised section on artificial respiration. The book is written in language appropriate to the age of the pupils for whom it is intended, and is freely and, on the whole, well illustrated. There is little to cavil at in the information which it contains, although the relative stress laid on the various aspects of hygiene will not meet the views of some teachers. The section on ventilation would bear modernisation as regards the effects of bad air on health, and it is doubtful if children's memories should be burdened with ingenious but little used ventilating apparatus described here at some length. Some of the diagrams are old fashioned, especially those relating to the stomach and intestines. On the whole, however, this book is a creditable attempt to deal with the difficult subject of hygiene in a way suitable for young children.

BIRTH CONTROL FOR THE LAYMAN

FROM a prefatory note to yet another little book on birth control it appears that Mr. G. R. Scott⁴ has written it for the lay public, in order to help married couples to solve their own contraceptive problems and select the method or methods best suited to themselves. He has succeeded only in dishing up a somewhat indigestible hotchpotch. Mixed with a certain amount of correct information are not a few practical blunders and a good deal of material which would have been better omitted. The number of methods described, their various possible and impossible combinations, and the lists of contra-indications and indications for their use must surely be confusing and largely unintelligible to laymen. The diagrams are poor and in one place at least inaccurate. It would be interesting to learn whether the author has had any practical experience of selecting and teaching methods of birth control.

REGULATION OF PROSTITUTION

Miss ALISON NEILANS, general secretary of the Association for Moral and Social Hygiene, writes: "In your issue of Dec. 28th, 1935, Dr. C. Rolleston expresses surprise at Dr. White's statement that the examination of prostitutes in regulationist countries is a perfunctory procedure taking one or two minutes. Dr. Rolleston appears to think that nowadays in Paris and the leading French towns these examinations are managed in a different way and much more thoroughly. I have not seen the periodic examination of prostitutes in Paris or in France, but I have seen it carried out by French specialists in Syria, under the French mandate, where the examinations are conducted for the supposed benefit of the French troops. The examination is still performed very much as described in Flexner's book. It takes rather less than one minute per woman examined, and, in addition, at intervals of a few weeks, I believe, a specimen is taken to examine for gonorrhoea. Also in Turkey at the present time the examination only takes from one to two minutes, but I will not comment on that as on the occasion when I saw it

¹The Hospital Almoner. Second edition. Prepared by the Committee of the Hospital Almoners' Association. London: George Allen and Unwin Ltd. 1935. Pp. 168. 5s.

²Modern School Hygiene. By R. Gamlin, M.A., M.B., B.C. Cantab., M.R.C.S. Lond., M.Hy. and D.P.H. Liverp., Chief Assistant School Medical Officer, Liverpool. London: James Nisbet and Co., Ltd. 1935. Pp. 388. 7s. 6d.

³A School Course in Hygiene. Second edition. By R. A. Lyster, M.D., Ch.B., B.Sc. Lond., D.P.H., Lecturer in Public Health and in Forensic Medicine at St. Bartholomew's Hospital, London. London: University Tutorial Press Ltd. 1935. Pp. 266. 3s. 6d.

⁴Facts and Fallacies of Practical Birth Control. By George Riley Scott, F.R.A.I., F.Ph.S. Eng., F.Z.S. London: T. Werner Laurie Ltd. 1935. Pp. 156. 5s.

performed it was only for the purpose of taking smears to look for the gonococcus.

"It is always stated that the prostitute in the brothel under medical examination is not usually the source of infection. In so far as that is true it probably is because women liable to periodic examination keep themselves rather cleaner, but they also take a great number of precautions to prevent being discovered in an infectious condition.

"With regard to the letter from 'Traveller' I might point out that the British authorities have completely abolished the regulation of prostitution throughout the whole of our Crown Colonies and dependencies; including Malta and Gibraltar. In Egypt alone this system of tolerated brothels with medical examination of women continues and the results, judging by the figures for the British Army in Egypt, are not altogether satisfactory."

MEDICAL VERSES¹

Mr. Roche has brought together here various verses, the majority of which were written over 15 years ago, many of them having seen light in the *St. Bartholomew's Hospital Journal*, *Round the Fountain*, and the *Busy Bees Magazine*. About one-third of the collection follows the usual type of rhymed skit on medical subjects, though Mr. Roche is both wittier and a better technician than most contributors to hospital journals. The remaining two-thirds contain superior work, and in one or two places display the author as observer and poet. But because some of these metrical exercises are good—note the verses on Chamonix, and the serio-comic obituary note on a blue-bottle—the inclusion of others not so good is regrettable. Some pruning would have raised the standard of the collection, and though great masters of the sonnet have taken liberties in rhyming, it is only they who can take liberties here. The book closes with translations from the Greek and Latin, where several neat renderings of epigrams will be found.

ARTHRALGIA FROM INJECTIONS OF BISMUTH FOR SYPHILIS

A STUDY of the records of the dermato-venereological department of the Rigshospital in Copenhagen has convinced Dr. V. Genner that injections of bismuth not infrequently give rise to more or less troublesome pains in the joints (*Nord. med. tidskr.*, Nov. 2nd, 1935, p. 1753). His study covers the period 1913-32 and concerns 5526 cases of syphilis. Until 1924—i.e., before the bismuth period, and when treatment consisted of injections of mercury and salvarsan—arthralgia as a consequence of anti-syphilitic treatment was unknown. It was only in 1924, the year after the replacement of mercury by bismuth, that such symptoms began to be noticed. Between 1924 and 1932 there were as many as 79 cases of what Genner describes as paratherapeutic ailments of the joints. During the first few years after 1924, the number of cases of arthralgia increased with the raising of the dosage of bismuth; and in the last five or six years, during which the bismuth dosage has been more or less stabilised, there has been a corresponding stability from year to year of the number of cases of arthralgia. As there were 2235 syphilitics treated between 1924 and 1932, these 79 cases represented an incidence-rate of 3.5 per cent.—the same for the two sexes. As a rule, several joints were involved, and the pain was reminiscent of that of rheumatic arthritis. Though it was most exceptional for it to be associated with swelling and redness, the pain could be quite troublesome, and in several cases it persisted for months after the treatment had been discontinued. In two cases its severity necessitated the patients' admission to hospital. In 73 per cent. of all the cases the pain began in the course of the two first series of injections; and the connexion between pain and injection

was often so intimate that the former followed the latter with only a quite short interval. It should be noted that the specific treatment given in the Rigshospital included salvarsan in a goodly proportion of the cases, in association with mercury before 1924, and with bismuth from 1924 to 1932; but it is only in a few cases that Genner gives salvarsan the credit for arthralgia. Indeed, only 4 per cent. of the cases of arthralgia occurred during or after a series of salvarsan injections, whereas 54 per cent. of them occurred during or after a salvarsan-bismuth series, and 42 per cent. of them during or after a bismuth series of injections. In several cases undergoing a combined course of salvarsan and bismuth injections, the arthralgia ceased when the bismuth was discontinued and the salvarsan continued; and relapses followed the resumption of bismuth treatment. Dr. Genner's attitude towards the pathology of bismuth arthralgia is guardedly non-committal.

DIARIES

THE HOSPITAL DIARY in its third year of issue elaborates the useful features with which it started. The quality of materials provided for the daily record is unexceptionable, and the opening section containing tabular information and some signed articles on hospital practice and administration are as useful as the hospital buyers' guide which concludes the volume. The diary, which is edited by Lieut.-Colonel Clement Cobbold, secretary of the Cancer Hospital, London, and Mr. H. F. Shrimpton, house governor of the Children's Hospital, Birmingham, can be obtained from G. R. C. Brook and Co., 27, Old Bond-street, London, W.1, for 5s. 6d.

Warner's CALENDAR OF MEDICAL HISTORY for the use of the medical profession gives a page for each day's record of events, and at the foot of each page is a useful calendar and some interesting item of medical biography or history. Tables of incompatibles, of poisons, of infectious diseases, of glandular secretions, and many others, contain much useful information attractively arranged. The calendar which is printed in the U.S.A. is issued by William R. Warner and Co., Ltd., 300, Gray's Inn-road, London, W.C.1.

THE PREVENTION OF NEUROSIS

Sir Walter Langdon-Brown has distinguished between those ill from unhappiness and those unhappy from illness. A large proportion of patients, even in favourable circumstances, owe their maladies to psychological maladaptation and it is therefore to be expected that in industry neurotics are responsible for much lost efficiency. Statistics have shown that in one factory there may be a sickness-rate of 3 days a year, while in another, where discontent is rife, it rises to 16. This difference seems chiefly to be due to psychological ill-health and, in a paper read before the Society of Medical Officers of Health on Dec. 20th, 1935, Dr. Henry Wilson discussed the causes of neurosis and showed how the methods of preventive medicine could be applied to the problem.

Inborn or physical handicaps, environmental difficulties, or unsatisfactory psychological habits are, he said, the factors which produce absence from work or chronic discontent. The neurotic settles these problems by evasion, but to classify his condition with moral defect is to hamper the psychologist in his already difficult task. Efficient treatment should be preventive in its aims and it is only by finding the cases in childhood that neurosis in the working adult can be excluded. About a tenth of all school-children are seriously backward in mentality, and this has probably a greater bearing upon crime and neurosis than is realised. The neurotic child, though overstrung and shy, tends to have an intelligence superior to his fellows, and he is at once at a disadvantage if his capabilities are either misunderstood or repressed. The attempts to assess the discrepancy between mental age and educational position are in the realm of preventive

¹ Medical and Other Verses. By Alex E. Roche. London: H. K. Lewis and Co., Ltd. 1935. Pp. 92. 3s. 6d.

medicine, for there the individual child can be studied, his needs discovered, and his emotions trained. The psychologist can detect early traits even before their importance is seen by the most intuitive teacher, and these can be treated before they become serious habits of mind.

Circumstances such as physical disease can be improved or the patient's attitude adjusted by satisfactory education and suitable employment. Attempts can be made, especially in the young, to remedy abnormal outlooks and reactions, but often the child's enemies are those in his own household, and the parents are to blame for the bad environment. It is here that the psychiatric social worker becomes indispensable to the clinician in dealing with neurotic manifestations. The object of the medical psychologist is to pick his material and to aid the children to have their values readjusted, not by taboos and social ostracism, but by a real sense of self-control.

Dr. Wilson looks forward to the time when the medical psychologist can apply to early cases what preventive medicine has offered to those physically diseased, when, by means of investigation, early notification, suitable environment, and complete treatment, he can make the misfit an asset instead of a burden to society.

NEW PREPARATIONS

DISSOLVED VACCINES G.L.—Under this name the Glaxo Laboratories Ltd., Greenford, Middlesex, are issuing vaccines "in which the bacterial cells are in solution and the toxic bacterial products are at the same time detoxicated." With ordinary vaccines an antibody response does not develop until antigens have been liberated from the bacterial cell by tissue lysis at the site of inoculation. Dissolved Vaccines, on the other hand, are said to make the antigens immediately available, and their action is therefore more rapid and consistent. Both solution and detoxication are effected by sodium lauryl sulphate which is present in the vaccines at a concentration of not more than 0.025 per cent. Owing to the detoxication, which affects endotoxins and exotoxins equally, the general level of dosage can, it is stated, be considerably higher than that of ordinary vaccines; indeed it is often possible to give a full dose at the first or second injection, no long series of graduated doses being necessary. Good clinical results obtained during the past two years are described in a booklet which may be had on application. The vaccines are put up in rubber-capped bottles in the following varieties: acne and staphylococcus, anti-typhoid-paratyphoid, cold (prophylactic), cold (treatment), influenza, staphylococcus and streptococcus, staphylococcus, streptococcus, whooping-cough (prophylactic), whooping-cough (treatment), gonococcus, and Shiga's dysentery bacillus. Autogenous vaccines can also be prepared.

CLAUDEN is a preparation of lung tissue recommended for the control of hæmorrhage. In the form devised by Fischl in 1916 it is a greyish-brown amorphous powder which can be applied as a local styptic. Besides this powder the Luitpold-Werk, Munich, now prepares a solution in ampoules—for intravenous, subcutaneous, and intramuscular injection, for irrigation of wounds and tooth-sockets, and for instillation into rectum or bladder—and tablets for protracted administration by mouth. All three forms are obtainable in this country from the Medical Laboratories Ltd., 40, Pall Mall, London, S.W. 1. It is claimed that the active principle is not impaired by alimentary digestion, and that after absorption or injection it never causes intravascular coagulation, its action being confined to the point where the blood-vessel is injured. The use of Clauden is advised not only for the prevention and treatment of surgical oozing but also for such conditions as hæmoptysis, nose-bleeding, menorrhagia, and hæmorrhage from the bladder. The makers issue a pamphlet based on over 350 references in medical publications, including

an observation by Knosp (1928) that Clauden reduces coagulation time by about half. Prolonged administration is reported to have overcome the tendency to hæmorrhage in hæmophilia.

ESTOFORM.—The chief constituent of this new antispasmodic remedy is an ester of formic acid, with the formula $\text{HC}(\text{OC}_2\text{H}_5)_3$, which is shown to be non-toxic to animals in doses as high as 5 grammes per kg. of body-weight. Estoform contains 10 per cent. of this ester, together with extracts of *Prunus virginiana* and senega, in a glycerin-spirit base, and doses up to 6 teaspoonfuls were given during clinical trials. The spasm of chronic and acute bronchitis was relieved, patients with miscellaneous coughs were mostly benefited, and definite improvement is said to have been obtained in a large proportion of asthmatics. It should be noted that this preparation contains about as much alcohol as ordinary spirits and requires to be diluted and taken preferably with meals. It is made by the Crookes Laboratories (British Colloids Ltd.), Park Royal, London, N.W.10.

THE OBSTINATE SYRINGE

Dr. C. S. RYLES writes: Having tried, without success, all the usual means for dealing with a valuable glass syringe whose piston was stuck in the barrel, I soaked the syringe in a little "penetrating fluid" such as motorists use for spraying the spring leaves of cars. After a week the piston came out easily. Probably others would be glad to know about this.

Medical Diary

SOCIETIES

- ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.**
TUESDAY, Jan. 7th.
Orthopaedics. 5.30 P.M. (Cases at 4.30 P.M.) Mr. Denis Browne: Club-feet. Mr. Alan Todd: Pes Cavus.
THURSDAY.
Tropical Diseases and Parasitology. 8.15 P.M. Dr. J. C. Cruickshank: Modern Methods of Diagnosis by Agglutination.
FRIDAY.
Ophthalmology. 8.30 P.M. (Cases at 8 P.M.) Mr. J. H. Doggart: Eclamptic Detachment of the Retina.
- SOUTH-WEST LONDON MEDICAL SOCIETY.**
WEDNESDAY, Jan. 8th.—9 P.M. (Bollingbroke Hospital, Wandsworth Common, S.W.), Dr. H. Crichton-Miller: The Neurotic as the Practitioner's Bogy.
- WEST KENT MEDICO-CHIRURGICAL SOCIETY.**
FRIDAY, Jan. 10th.—9 P.M. (Miller General Hospital, Greenwich, S.E.). Clinical evening.
- WEST LONDON MEDICO-CHIRURGICAL SOCIETY.**
FRIDAY, Jan. 10th.—8.30 P.M. (West London Hospital), Dr. Halls Dally, Dr. L. S. T. Burrell, and Dr. Evan Bedford: Pain in the Chest.
- LONDON JEWISH HOSPITAL MEDICAL SOCIETY, Stepney Green, E.**
THURSDAY, Jan. 9th.—4 P.M., Mr. A. D. Griffiths, Mr. H. A. Kisch, and Dr. C. C. Worster-Drought: Head-aches.
- LECTURES, ADDRESSES, DEMONSTRATIONS, &c.**
- FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.**
MONDAY, Jan. 6th, to SATURDAY, Jan. 11th.—St. JOHN'S HOSPITAL, 5, Lisle-street, Leicester-square, W.C.
 Afternoon course in dermatology.—WEST END HOSPITAL FOR NERVOUS DISEASES, In-patient Department, Gloucester-gate, N.W. Demonstration on Fundus Oculi, by Mr. R. Lindsay Rea, at 8.30 P.M., on Tuesday, Jan. 7th.
- LONDON SCHOOL OF DERMATOLOGY, 49, Leicester-square, W.C.**
TUESDAY, Jan. 7th.—5 P.M., Dr. H. Corsi: Syphilis through Four Centuries.
THURSDAY.—5 P.M., Dr. J. M. H. MacLeod: Ringworm Infections.
- ST. JOHN CLINIC, Ranelagh-road, S.W.**
FRIDAY, Jan. 10th.—4.30 P.M., Dr. Philip Ellman: Physical Methods in Diseases of Heart and Lungs.
- GENERAL INFIRMARY, Leeds.**
TUESDAY, Jan. 7th.—3.30 P.M., Dr. Veale: Demonstration of Medical Cases.
- LEEDS PUBLIC DISPENSARY AND HOSPITAL.**
WEDNESDAY, Jan. 8th.—4 P.M., Dr. Hartfall and Dr. Garland: Diagnosis and Treatment of Rheumatoid Arthritis.

ADDRESSES AND ORIGINAL ARTICLES

CARCINOMA OF THE ŒSOPHAGUS
THE QUESTION OF ITS TREATMENT BY
SURGERY*

BY G. GREY TURNER, D.Ch., M.S. Durh.,
 F.R.C.S. Eng., F.A.C.S.

PROFESSOR OF SURGERY IN THE UNIVERSITY OF LONDON AT
 THE BRITISH POSTGRADUATE MEDICAL SCHOOL,
 HAMMERSMITH

"If you have no confidence in success, you can have no hope of winning."—*Lord Lovat.*

In the long history of this lectureship extending over a period of 52 years, no one appears to have thought it worth while to deal with the subject which I have chosen. Probably the reason is because malignant disease of the œsophagus has always been looked upon as so hopeless from every point of view. It is recorded of Dr. William Wood Bradshaw, the founder of the lectureship, that he was a quiet, home-loving, studious man, who diligently cultivated his mind both in literature and science. For many years he practised at Andover and Reading and was for a time vice-president of the Pathological Society in the latter town, so that he was probably very familiar with the sad clinical history of these cases and of the pathological processes which, if unchecked, gnaw steadily at the vitals until death comes to the rescue. The attention which is directed to this subject from time to time is probably the expression of a desire to remove a reproach and to conquer a hitherto unassailable peak. So far the rewards have been few and bestowed infrequently but:—

"Delusion sweet thus tempts us on
 Till all the leaves are like to one
 Yet Hope looks back as heretofore
 And smiling seems to say encore."

J. M. W. Turner.

The majority of physicians and very many surgeons seem to have already decided that, except for palliative measures, surgery cannot claim a place in the treatment of carcinoma of the œsophagus and the earnest student will get nothing but discouragement from text-books. Most authorities still seem to think that it is along other than surgical avenues that legitimate treatment must be directed. As a matter of fact although radium and deep X ray therapy both hold out great promise, no one can claim that at present either method can be expected to do more than palliate these cases, although there are odd instances in which a cure has possibly been attained. At the same time these are no more frequent than the occasional successes as the result of surgical intervention; so that it comes to this, that none of the workers in any field can afford to belittle the efforts of others or can legitimately crow over their own success. In each of the spheres of therapeutic endeavour great ingenuity has been displayed and an enormous effort expended. In this lecture I only propose to tell you something about my own personal experience. It would take far too long even briefly to review the vast amount of work that has been carried out on this subject

and as that has been repeatedly done in the immediate past, I doubt if it would serve any useful purpose.

Some Pathological Considerations

"First things come first."

The prelude to successful treatment must always be an understanding of the pathological features and this is peculiarly so with a secluded structure like the œsophagus, inaccessible and difficult of observation. It has been persistently stated that carcinoma of this organ is of a particularly virulent type that disseminates wide and early, and this teaching has had a depressing effect on the outlook with which the condition has been viewed by the profession. It is only fair to say that those who have paid particular and critical attention to the subject, and especially with a view to the possibilities of direct interference, have from time to time pointed out the fallacy of this commonly accepted dictum. In what one is pleased to call the old days, there was much excuse for this unhappy view of the nature of these œsophageal growths because the observations made in the post-mortem room were nearly always on those subjects who had endured a lingering death from malignant disease of this part without any means having been taken to stay its progress. Anyone who examines the specimens of cancer of the œsophagus in our museums must be depressed by the shockingly advanced condition which they represent. What we really most want to know is the morbid anatomy at a stage at which the question of some form of active treatment arises. We also want exact knowledge of the mode of spread of malignant disease of the œsophagus and the various types which are undoubtedly present together with their most prominent features.

In ten cases in which I removed a portion of the œsophagus for carcinoma, the obvious growth varied in length from 1½ to 3 in. In three instances the tissues beyond the œsophageal wall were invaded and there were obviously infiltrated glands in close proximity. The smaller growths had the appearance of a constricting type as viewed from the outside. All had infiltrated the wall to some extent but none were of the massive or fungating type so commonly seen in museums, and in only one was there proved evidence of distant dissemination—that in the form of secondary deposits in the lung.

In this connexion it is illuminating to review the results of the after-death examinations of a series of patients which I have recently observed at the Hammersmith Hospital.

There were ten who died under observation without any treatment other than palliative gastrostomy. In three there were secondary deposits in the liver or spleen, the total duration of the illness being 14, 16, and 8 months respectively. In one of these cases the growth was situated in the lowest part of the œsophagus and had extensively invaded the cardia and might properly be considered an example of cancer of that part of the stomach which had invaded the œsophagus. In the other seven, the disease had only extended to the surrounding parts or had spread to the glands in the immediate vicinity but without any evidence of distant dissemination.

ROUTE AND RATE OF DISSEMINATION

These findings are entirely in keeping with what I have previously found from the observation of a number of such cases in Newcastle-upon-Tyne. But, of course, there are cases in which distant dissemination does occur and in what is apparently an early stage of the disease, that is to say, as judged from the onset of the symptoms. One may safely conclude that in the œsophagus as in other parts

* Bradshaw lecture delivered before the Royal College of Surgeons of England on Dec. 5th, 1935.

of the body, malignant disease varies in type and in behaviour. The growth may for long remain localised and comparatively slow in its spread, at other times it may involve a considerable part of the wall and rapidly invade surrounding structures, or it may early disseminate both by lymphatic channels and by the blood stream as shown by the occurrence of secondary deposits in distant parts. Very occasionally it may rapidly assume such widespread extension locally and generally as to bring it under the head of general carcinomatosis. In my Bigelow oration I expressed the opinion that probably half the cases remain local until the time of death; in the other half there is spreading to more distant parts. Increasing experience and more detailed attention to this matter lead me to believe that this proportion is probably too high and that one may expect at least two-thirds of the cases to belong to the more limited and locally spreading group. If we exclude from this computation those growths which arise from the so-called abdominal portion of the œsophagus, then the proportion of those that disseminate will be still further and notably reduced. Chevalier Jackson, after an experience of nearly half a century, states of cancer of the œsophagus, "It is not an aggressive type of malignancy; on the contrary, it is a mild, slow and for a long time purely local process."¹

In previous writings I have given clinical illustrations of the general truth of these statements. There must be an early stage at which such growths are limited to a comparatively small area of the œsophageal wall and at which, if there is glandular involvement, it is in the immediate vicinity only. Such a statement suggests the value of the knowledge of the earliest stages of the commencement of the disease. What relation has its early features to the economy of the body and would it be possible at any stage to deal with the condition effectually by some endoscopic method? In order to obtain information on these points I have asked several of my friends who have the opportunity of examining large numbers of patients by the œsophagoscope. They all have to admit that the great majority are fully developed when they come under observation and that the possibility of local radical endoscopic treatment practically never occurs. But many workers are looking out for such opportunities and in the *Proceedings* of the Mayo Clinic for July, 1935, H. J. Moersch tells of a localised carcinoma which he was able to remove by endoscopic diathermy, the patient being alive and free from recurrence six months later. Unless it becomes the routine to examine systematically large numbers of patients endoscopically without waiting for symptoms, it is unlikely that growths in an early stage will be found. It is said (Chevalier Jackson) that normal swallowing can take place when the diameter of the œsophagus is only 5 mm. and that probably the peristaltic wave is not interfered with until the growth becomes annular. This knowledge emphasises the imperative necessity and importance of skilled examination by methods of precision the moment there is any complaint of alteration in the act or comfort of swallowing.

The problem, though so much more difficult, is very similar to the position with regard to the diagnosis of early malignant growths in the rectum. For long I had hoped that the almost routine use of the sigmoidoscope would lead to the discovery of many cases of rectal cancer in which it would be possible

to contemplate an early local resection with conservation of the sphincter. Unfortunately this hope has not so far matured.

Anatomical Considerations

The main facts of the anatomy of the œsophagus are well understood and for the most part adequately dealt with in the more ample books on anatomy. For those who contemplate direct surgical interference I would, however, suggest that the best way to study the relationships of the parts concerned is in transverse sections of the body. In order that the impression may be an accurate one, it is essential that such sections should be life-size, as it is so easy to be misled with regard to depth and distance by reduced pictures of this sort. For the purpose I can strongly recommend the "Atlas of Topographical Anatomy of the Head, Neck, and Trunk" produced by the late Prof. Johnson Symington of Belfast. The true œsophagus itself is really shorter than one imagines and a length of from 9-10 in. is usual. This is about the same as the length of the ureter in situ or the distance from the antecubital fossa to the front of the wrist. It is quite true that the tube may vary to some extent, depending for the most part on the size of the subject, and it may be elongated to a remarkable extent when obstruction is of long standing, but this does not appertain in cases of malignant disease. The normal distance from the teeth to the point where the œsophagus enters the stomach is 16 in. The levels of the various parts of the œsophagus are best stated in relation to the bodies or to the spines of the vertebræ. It is convenient to remember that its commencement is opposite the sixth cervical spine, its lower extremity opposite the ninth dorsal spine, and that the crossing of the left bronchus, which is just below the arch of the aorta, is opposite the fourth dorsal spine. It is important to realise that the œsophagus closely follows the conformity of the spine and when, as so frequently happens in the elderly, there is a considerable kyphosis, the upper part of the œsophagus passes almost directly backwards in the early part of its course. There is also some lateral deviation of the œsophagus so that in the upper part of the thorax it inclines more to the right, whereas in the lower part it definitely abuts to the left. For the exposure of its upper part the right side should therefore be selected while for the lower part the left is more convenient. This refers not only to the transpleural approach but to the approach from the posterior mediastinum. Many surgical writers do not appear to appreciate the fact that, though the whole muscle is extraordinarily *distensible*, it is not *extensible* to any extent and only a very small portion, amounting to not more than 4 cm. (a little less than 2 in.) can be excised if the ends are to be brought together without tension. It must also be realised that the tube is readily friable for the muscular wall tears easily, though the submucous coat is tougher. The mucous membrane is in excess and tends to bulge through any incision in the muscular wall. Possibly these conditions are exaggerated when there has been obstruction with consequent alteration in the œsophageal wall.

RELATION TO THE PLEURA

From a surgical point of view, perhaps the most important relation is that of the pleura. It is not sufficiently realised that this membrane is in contact with practically the whole length of the tube on both sides. On the right the contact is intimate

¹ Arch. of Surg., 1926, xii., 236.

throughout; on the left there is a middle portion in which it is protected from the pleura by the prominence of the aorta, but on this side the lowest part of the sac goes definitely behind the oesophagus and is in jeopardy when this part is attacked surgically. Opposite the bodies of the eighth and ninth dorsal vertebræ the two pleuræ sometimes almost meet behind the oesophagus providing this part with a sort of mesentery. These relations have been very carefully verified by my friend, Mr. James Whillis, and the diagram which he has made for me is very accurate (Fig. 1). This relationship is of great importance, because when we attempt to separate the oesophagus from its bed

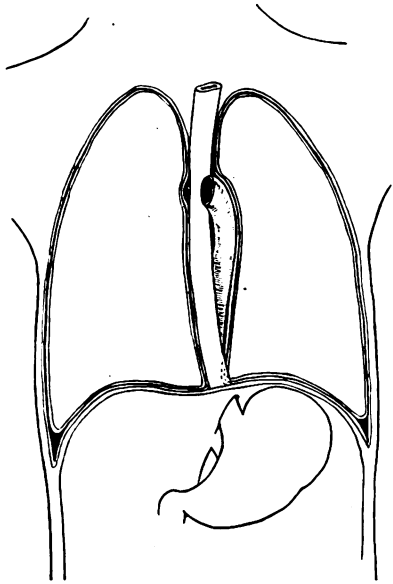


FIG. 1.—Anatomical considerations: showing the relation of the pleura to the oesophagus. (Dissection and drawing by Mr. James Whillis.)

bringing about this obliteration by some previous preoperative interference, though it is admittedly difficult to ensure that any known method will safely produce pleural adhesions as desired.

THE "TUNNEL"

The next important point is to recognise that while for the most part the oesophagus lies more or less unattached in its bed of cellular tissue, there are certain definite points at which one must expect a certain amount of anatomical fixation. The first of these is the well-recognised broncho-oesophageal muscle attached to the back of the trachea just at its bifurcation or to the left bronchus. This may also connect to the back of the pericardium. The other and less well-recognised points of fixation are near the dome of the right pleura, the arch of the aorta, the subclavians, and the common carotid arteries. The adhesions to the blood-vessels usually contain branches of the vessels to which they connect. Dr. Vincent Pallares, who is now working with me at the postgraduate school, has verified these matters. Except at these points the oesophagus is not adherent to the very important structures which one finds as its fellows. The bed of cellular tissue in which the oesophagus lies is not so obvious in the developing fœtus, but it gradually becomes very well marked in adult life, although unfortunately it is difficult to demonstrate by any pictorial method. Neverthe-

less anybody who examines the oesophagus in situ must be struck by this very loose connexion and by the way it can be very readily separated from its surroundings. The presence of this cellular tissue practically amounts to a bursa surrounding the tube, providing the freedom which is so necessary for its unimpeded movement, not only in the act of swallowing, but during the movements of the body. The importance of this bursa is well illustrated by those occasional cases in which some part of the tube gets abnormally attached, in inflammatory conditions of the glands for instance, and in consequence a traction diverticulum develops. This oesophageal tunnel can be demonstrated in dissections of the fresh cadaver and its surgical importance is at once realised when it is entered from the diaphragmatic hiatus, for the finger can be readily swept round the oesophagus which at this site is extraordinarily easily separated from the bed in which it lies. I have attempted to demonstrate this bursa by distending the cellular tissue with fluid or with oxygen, and I am able to show an X ray in which the latter method was used in a young subject. When a hollow needle is thrust into the lower part of the tunnel and the oxygen turned on, the latter immediately passes up by the side of the oesophagus and reaches the cellular tissue in the root of the neck, and this happens on both sides of the tube, but it is difficult to distend the cellular tissue in front and behind. The arteries which supply the oesophagus next demand attention. The important point to realise is that there are no large branches that pass directly to the tube, so that there is fortunately for surgical purposes safety in numbers.

The arteries are all subsidiary branches springing from named vessels like the inferior thyroid, the bronchial arteries, the intercostals, and the aorta, and they pursue a course of some length before they reach the oesophagus itself. It is also of some moment that for the most part they pass in a downward direction before finally breaking up on the wall of the tube. The vessels supplying the lower end are in a different category. Here the main artery is undoubtedly the special branch from the left gastric, but there is another from the left inferior phrenic. As can be seen in any well-injected specimen, these numerous vessels eventually break up into a very fine plexus on the oesophageal wall.

BLOOD AND LYMPHATIC SUPPLY

In the early days of my surgical interference with the oesophagus, I came to the conclusion on clinical grounds that the blood-supply of that part, which is about one and a half inches above the diaphragm, was, to say the least, precarious. This and other matters have been verified by the Japanese worker Ohsawa, who has shown by a very interesting series of observations the exact area of the oesophagus which receives its supply from the various vessels. The diagram in his recent publication ("The Surgery of the Oesophagus") illustrates this state of affairs very clearly and defines the dangerous anæmic spot, which is of extreme importance in connexion with some of the operative procedures which have been suggested and carried out.

For surgical purposes then we may take it that the oesophagus from its commencement to just below the bifurcation of the trachea is adequately supplied with blood. Below this point the supply becomes less until at a spot about 1½ to 2 inches above the diaphragm it is very poor, in fact dangerously so, for any surgical interference. The last part of the oesophagus above the diaphragm and the intra-abdominal portion is well supplied from the left gastric and from the left

inferior phrenic. The arrangement of the veins is fortunate from the surgical point of view. When I first began to contemplate direct interference with the œsophagus I was very fearful of the hæmorrhage which I expected would come from the azygos veins, but, as a matter of fact, these great trunks do not receive blood directly from the œsophagus and the intermediary vessels only open into the azygos after considerable interval. There are also large branches, which open into the thyroid veins in the neck and, at the lower end, veins, which join the abdominal coronary system. Of course, there are many variations, and in pathological states the veins may be extremely congested as in œsophageal varix, but this condition is not likely to occur in carcinoma.

The relationship of the vagi is also a matter of importance and concern but, again fortunately for the surgeon, the main trunks are not closely adherent and can be separated without much trouble and, in point of fact, except when infiltrated by growth they seem to look after themselves in a wonderful way when the œsophagus is isolated for any surgical purpose.

The lymphatic arrangements seem to be well understood and in keeping with the usual description, but I would like to stress the fact that some of the lymphatics from the lowest part of the œsophagus drain into the glands along the lesser curvature of the stomach, although drainage in the opposite direction may also occur. There are several lymphatic glands lying directly on the œsophageal wall and lymphatic vessels also drain to the peribronchial lymphatics at the root of the lung. The upper part of the œsophagus drains mainly into the lower deep carotid glands. The supraclavicular lymphatic glands on both sides receive a supply from all parts of the œsophagus.

The development of the œsophagus has some bearing on our surgical outlook. For instance, it is well to realise that in the very active changes during the second month of foetal life it is really pushed backwards into the cavity by the development of the lungs and pleuræ. When, therefore, the œsophagus is removed surgically by withdrawing it up into the neck after mobilisation, it is but retracing the steps which brought it into the secluded position which it normally enjoys.

RESISTANCE TO INFECTION

When anatomists speak of the abdominal portion of the œsophagus they are at considerable difficulty to define its exact demarcation; histology and pathology are probably more helpful than the ordinary landmarks for which they seek. The line of demarcation between the epithelium of the œsophagus and that of the stomach is not a very sharp one, and it is quite common to find a graduation between œsophagus and gastric mucous membrane when the matter is looked at histologically rather than by the naked eye. Pathologically growths in this lowest portion of the œsophagus resemble neoplasms of the stomach in their behaviour, for they not only involve the lymphatic glands in the lesser curvature, but they tend to disseminate, and secondary deposits in the liver are a marked feature. The resistance to organised invasion of the cellular tissue surrounding the œsophagus is a matter of supreme importance when surgical interference is contemplated. It has usually been looked upon as of low resisting power, and clinically it is well recognised that infection of this tissue, known as the clinical entity "acute mediastinitis," is extraordinarily rapid in its develop-

ment, severe in its manifestations, and most lethal in its termination. This matter has concerned me very much indeed in connexion with the surgery of the œsophagus and, because of these known characteristics, I have always feared that acute infection of the cellular tissue would be almost a complete obstacle to surgical interference in this neighbourhood. This known tendency to infection is an excellent reason for so arranging technical procedures that no division of the œsophagus and no suturing, which might possibly be attended with leakage, is made in the midst of the tunnel. In the cases in which I have been able to excise the œsophagus and in which the patient has completely recovered or has lived for a considerable time, I have been struck with the almost entire absence of any evidence of acute infection, which I so much feared. It may be that by removing the œsophagus the cellular tissue is so freely opened up that drainage comes to our aid, but that cannot be the sole explanation because in my most successful case external drainage was not provided and yet the patient recovered so well that in three weeks he was able to leave the hospital apparently quite well.

Problems of Diagnosis

In adults a history of steadily increasing difficulty in swallowing without any previous causative factor, such as an injury from imbibing noxious fluids, is almost pathognomonic of œsophageal neoplasm. In the other causes of obstruction such as pouches or spasm the symptoms are for long intermittent and come on in definite attacks which pass off spontaneously. As a rule the onset of dysphagia due to malignant disease is gradual and takes the form of an increasing difficulty with solid foods. More rarely the onset may be sudden, and those patients are fortunate in whom the blocking of the neoplastic œsophagus by some hastily swallowed bolus of solid food early draws attention to unsuspected narrowing, if indeed this warning is promptly followed by the thorough investigation which it demands. This event is comparable to the patient with the large intestine growth, to which attention is first drawn by some solid body amongst the fæces. The average length of history is usually short and yet in the majority, in fact almost always, we find that the disease is well developed at the time that examination is first made. These considerations suggest that in most cases the disease is already well advanced before any symptoms arise. Chevalier Jackson, who has had the opportunity of observing many cases by repeated œsophagoscopy over long periods of time, has accumulated data from which he concludes that most growths have been present for many months before symptoms arise. He is of opinion that when the growth has reached the stage of complete obstruction the lesion has been present for at least a year and probably longer.² Often the discovery of a well-developed growth with a short history has been so surprising as to stimulate one to make a very searching inquiry as to earlier symptoms, but this very rarely discloses anything which might have led the patient even to suspect that there was something amiss. The plain duty of the profession is to realise that any interference with the act of swallowing in adults usually means that a new growth is present and that being so, as soon as a patient exhibits such symptoms a full investigation should be carried out, rather than those temporising measures which so often delay the

² Southern Surgeon, 1935, iv., 1.

arrival of the patient until the disease has still further advanced, often by months. In a series of my own cases the average time which elapsed between the onset of symptoms and the opportunity for dealing with the matter was no less than 15 weeks.

SIGNIFICANT SYMPTOMS

Once having been discovered, the symptoms do tally with pathology and the variation in the speed of the growth is sometimes very remarkable. Some clue as to the type may be suggested by the symptoms of the patients. Those who harbour rapidly growing neoplasms complain of weakness and loss of general health and appetite, rather than of the extreme local disability as disclosed by dysphagia. Long ago my old teacher, Prof. Rutherford Morison, used to point out that the lack of appetite often meant that there were already secondary deposits and that the patient was not likely to live long. There can be no doubt that the outlook in patients who complain only or mainly of mechanical difficulty is much more hopeful than where general weakness and impaired condition is out of proportion to the inability to take food. Anæmia and rapid loss of weight are ominous symptoms. Persistent cough, or cough made worse whenever the patient takes food, is also a very bad sign and often means that a communication between the respiratory passages is already established. But it is incorrect to assume that such a communication will immediately be followed by some type of septic pneumonia although that is so frequent a sequel. I have recently observed a patient on whom gastrostomy had been performed seven months previously for a malignant growth in the oesophagus. The condition was investigated by an opaque drink, and to our surprise we secured a beautiful bronchogram of the left lung. The presence of the opaque material in the bronchial tree did not appear to give rise to any disturbance whatever, and without any special treatment of any sort this man lived for a further period of eight weeks and then slowly died from a general process of inanition. At the same time, if there is any suggestion of such a communication it is most important that such interference as may be necessary should be conducted under local anæsthesia.

Sometimes there is long-standing history of either persistent difficulty in swallowing or an exacerbation of a degree of difficulty which has existed for many years. I have come across this combination in two striking cases. While this sort of history is usually suggestive of some condition that is non-malignant, it must be borne in mind that some of these patients

do ultimately develop malignant disease and I think that is especially so in women. The comparative frequency of an upper oesophageal spasm in the female sex has often been noted and has been followed by the development of malignant disease in quite a proportion of cases. Prof. Lambert Rogers, who has drawn attention to this association,³ is inclined to think that the treatment he advocates may be in some degree prophylactic against the development of malignant disease.

When a patient is examined as soon as difficulty in swallowing declares itself, it is unlikely that there will be any physical signs that can be discovered by ordinary methods. We must urge the complete examination at this stage by the X ray and the oesophagoscope wherein seems to lie the only hope of discovering the growth at a stage at which treatment has a chance to be effective. But, at whatever stage the patient is seen, it is essential that an ordinary examination should be made in the first instance, if for no other purpose than to eliminate conditions suggestive of dissemination. Such an examination involves the palpation of such part of the oesophagus as can be reached in the root of the neck. Sometimes the growth can actually be felt; it may even then be stony-hard and fixed, or it may be moved from side to side and moves up and down on swallowing. Though the actual growth is rarely felt, there may be some enlargement of the glands which is suggestive, and in this disease the glands at the root of the neck are commonly affected on both sides. In the same way the lower end of the oesophagus is sometimes suspected to be the seat of a growth, when, as a matter of fact, the neoplasm is really in the cardiac end of the stomach. In these circumstances the growth may occasionally be felt in the latter situation and there is no excuse for not making such

an examination as might detect it. For the same reason and in order to eliminate advanced cases examination of the liver and peritoneal cavity for secondary deposits is important.

USE OF X RAYS AND OESOPHAGOSCOPE

The detection of growths in the middle part of the tube by ordinary examination is wellnigh impossible, but it should never be omitted because sometimes the signs point to an extra-oesophageal growth, which will explain all the symptoms. The confirmation of the diagnosis in the absence of physical signs is of course most conveniently made by X ray examination, and this may tell us a great deal more than

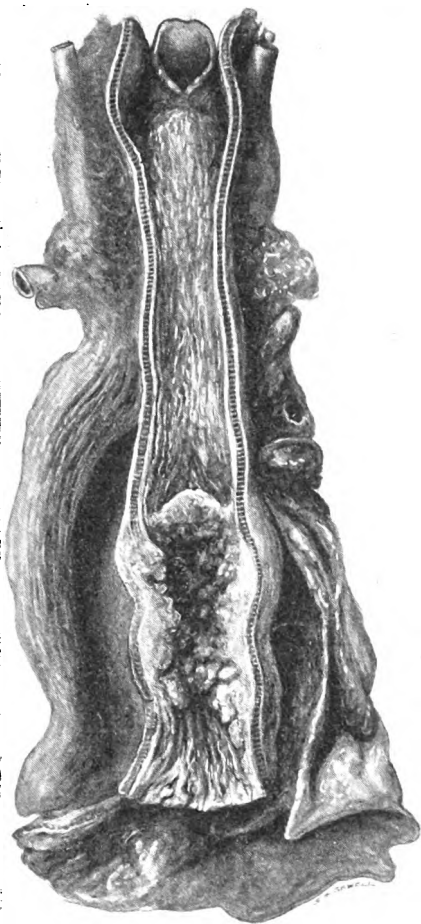


FIG. 2.—Large growth in lower oesophagus almost completely separated from its bed as a result of exploration from the abdominal hiatus.

³ Brit. Jour. of Surg., 1935, xxii., 829.

merely the situation and the nature of the obstruction. In fact, if we are to contemplate direct interference, we must ask of it information, not only as to the nature and site, but with regard to the size, the shape, and especially the length of the growth, as well as the question of the condition of the oesophagus above it. It is also by this plan that I think we may get the most valuable help as to the question of fixation of the growth by local infiltration. This may be demonstrated by the absence of the swallowing movements conveyed to the growth and possibly by movement in response to change of position. It has been suggested that the relationship of the neighbouring organs, for instance the aorta and the heart, may similarly give such information.

After the X ray examination, the use of the oesophagoscope is by far the most important method. By its means the presence and nature of a suspected lesion can usually be determined and in doubtful cases a fragment may be removed for histological examination, while the presence of outlying nodules and multiple growths may also be established. I have been a little disappointed at the small amount of other information which this method furnishes; one cannot get much help with regard to the extension of the growth beyond the wall of the oesophagus. If there is any question of the involvement of the lung root, bronchoscopy should certainly be carried out and has occasionally given valuable information. The method of retrograde oesophagoscopy is now on trial and may have possibilities that make it worth while, in spite of the fact that it demands an abdominal operation in itself. Gross extension to other parts and the involvement of nerves, such as the recurrent laryngeal and sympathetic, are an evidence of the utter futility of any but the simplest palliative measures. As yet most patients suffering from oesophageal growths are in a state of serious subnutrition when they come under the notice of the surgeon, and gastrostomy or jejunostomy is imperative. In these circumstances I think it is much better to make the gastrostomy first and to carry out detailed investigation as soon as their condition will allow. Whenever the patient's condition permits the upper abdomen should be explored at the time that the gastrostomy is made. When the growth is at the lower end, any extension to the stomach can be noted and whether or not there are secondary deposits in the liver. The condition of the glands along the lesser curve of the stomach is most important, for when they are infiltrated in oesophageal cases it almost invariably means that the growth is entirely beyond the possibility of direct interference. But having discovered the presence of a growth and eliminated such ordinary signs of dissemination as can be made out on clinical examination, what more can we do in order to determine whether or not there are such hidden extensions of the neoplasm as to render an attempt at its removal inadvisable?

I would like to emphasise the importance of re-examining these patients after such relief as may have been provided by gastrostomy. An extension to the bronchus may be entirely unsuspected one day, while by the next perforation may have occurred and aspiration pneumonia be developing. General well-being as expressed by the patient, appetite and relish for food, and gain in weight are the best indications of improvement. Despite what has been said by the ardent endoscopists about the futility of surgical exploration there are ways in which useful information may be gained without unjustifiable risk.

THREE AVENUES OF EXPLORATION

Growths in the upper third may be explored by exposing the oesophagus in the root of the neck and sounding the oesophageal tunnel with the finger. If the growth is found to have infiltrated the peri-oesophageal tissues or neighbouring structures like the trachea or aortic arch the exploration may be abandoned without the patient coming to any harm. With growths in the lower third the same sort of exploration may be conducted from the abdomen. The left lobe of the liver should be mobilised and the tunnel sounded with the finger introduced through the diaphragmatic hiatus (Fig. 2). For growths in the intervening portion, the transpleural approach is both feasible and practicable and is not necessarily attended with any great risk.

By whatever route the exploration is conducted, it should be the rule that unless the oesophagus with the growth can be easily separated from its bed by the insinuating finger it is best not to attempt removal. I have conducted each of these methods of exploration without any harm coming to the patient. When it has been otherwise the fatality has nearly always resulted from opening up an infected focus outside the growth or actually tearing into the growth itself. In either case a rapid form of infective mediastinitis has carried off the patient. Whenever the surgeon makes such an exploration, he ought to be prepared to carry straight on with the operation of excision if found to be feasible. In some cases a growth of the lower oesophagus has been explored by sounding the tunnel at the time of making the gastrostomy. Having found the conditions favourable for an attempt at removal, I have returned to the problem in three or four weeks' time when the patient's general condition had sufficiently improved to warrant the attempt at excision. To my dismay the growth was by then densely fixed and irremovable, presumably a consequence of the previous traumatism which the exploration had inflicted. So that I am prepared to advise that if the patient is well enough when the gastrostomy is required, the condition of the liver and the glands along the lesser curvature may be investigated, but that any further exploration should be deferred until the patient has obtained the optimum improvement from preliminary measures and the surgeon is prepared directly to follow up exploration by excision should it appear feasible. For my own part I am not depressed by the 12 cases in which exploration has shown that the disease was too far advanced, but am greatly impressed by the fact that in no less than 19 cases it was possible to remove the growth, and in 13 with great promise of success, if technical preparation and achievement had been equal to the opportunity.

(To be concluded)

BRISTOL ROYAL INFIRMARY.—The number of patients received during the year at this hospital again reached a record, the casualty department dealing with 42,000 cases (115 a day). The annual expenditure exceeds the annual income by £30 a day.

HOME FOR RHEUMATIC CHILDREN AT SMETHWICK.—Dr. Clyde McKenzie, chairman of the health committee, announced at a meeting of the Smethwick town council on Jan. 1st that the Ministry of Health had approved the scheme for the provision of a home for rheumatic and marasmic children. The building will accommodate some 30 children, and will adjoin the Firs Open-Air School, which those children will be able to attend.

INTERMITTENT CLAUDICATION AND ITS QUANTITATIVE MEASUREMENT

By H. T. SIMMONS, Ch.M. Manch., F.R.C.S. Eng.

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(From the Department of Surgery, University of Manchester)

INTERMITTENT attacks of limping in horses have been recognised by veterinary surgeons for well over a century and in 1831 Boullay¹ demonstrated that they were associated with an ischæmic condition of the hind limbs. In 1858 Charcot² described a similar condition occurring in a man and introduced the name intermittent claudication. His patient had a traumatic aneurysm of the proximal part of the right common iliac artery, with obliteration of the lumen of the distal portion, and Charcot pointed out the similarities between the intermittent limping of this man and that observed in horses. Erb,³ and the German writers immediately following him, gave excellent descriptions of the claudication and associated symptoms, but wrote as though it constituted a morbid entity, inventing at the same time a number of different descriptive names which only served to confuse the issue. Buerger⁴ vigorously attacked the suggestion that this condition constitutes a disease; he pointed out that intermittent claudication is a very striking symptom of muscular ischæmia due to varying pathological conditions.

A small proportion of cases of intermittent claudication are due to pure spasm of the arteries in neuropathic individuals and no structural disease of the vessels is demonstrable either at the time or in later years. Apart from this relatively rare "functional vasomotor" type, the presence of this symptom is evidence of organic vascular disease which has produced some degree of occlusion in the vessel. Arterio-sclerosis, thrombo-angiitis obliterans, and syphilitic endarteritis are the usual causes of the vascular disease. The symptom of intermittent claudication is, however, most often present and best studied in thrombo-angiitis obliterans.

The patient complains that shortly after beginning to walk he notices paræsthesiæ, tension, and weakness in the calf muscles which become painful. These symptoms steadily increase in severity so that walking is embarrassed and finally becomes impossible. The symptoms fade after a rest of a few minutes and a further period of walking is then possible.

The pain is cramplike and arresting, usually in the calf, but sometimes in the sole of the foot. A few patients

have likened it to "a clod of clay under the foot," and others to a "tight string tied round the calf, just below the knee." The trouble begins earlier if the patient walks rapidly, or uphill, an observation which he quickly makes and allows for in his walking. The muscles of the thigh and buttock may be affected, indicating involvement of the iliac vessels and a graver prognosis.

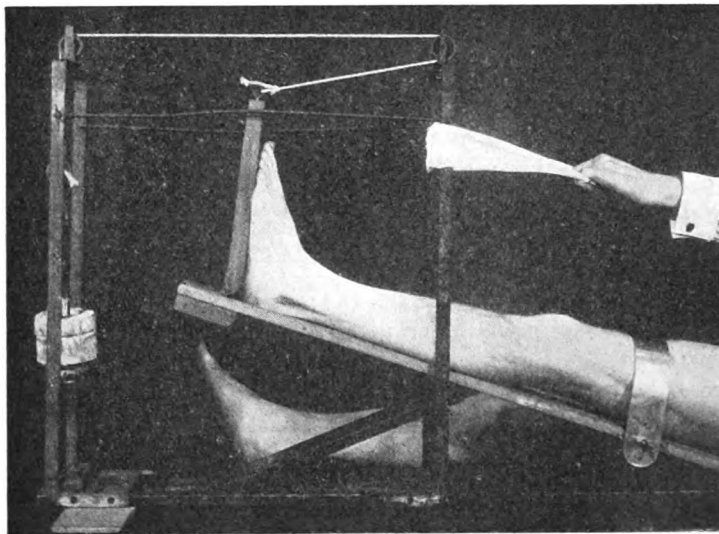
This typical sequence of embarrassment of muscular action after a short period of work, followed by recovery on resting, occurs in other muscle groups, and the term intermittent claudication is applied to the syndrome when observed in any part of the body, though it is usually restricted to its occurrence in the lower limbs. The arms are occasionally affected in arterio-sclerosis, and in thrombo-angiitis the presence of claudication in the arms is of grave omen because the legs will be found to be extensively involved, if, indeed, they have not already been amputated. Determan⁵ reported the case of a young Russian whose tongue was affected so that after 5-8 minutes, speech became impossible and the motility returned only after a period of rest.

Charcot believed that the pain was due to the ischæmia and resulting anoxia of the muscles and nerves of the limb, but Lewis⁶ with his recent experiments suggests that the muscles elaborate a pain-producing factor (P). This passes out into the tissue spaces and is normally removed by the blood stream. The development of pain is dependent on the accumulation of a certain concentration of this substance in the tissue spaces, and so long as the circulation is adequate pain is avoided. Should the circulation be inadequate, pain is produced when the requisite concentration of P is attained, and disappears only after a period of rest long enough to enable the blood stream to wash away the P factor and lower its concentration below the pain threshold.

A METHOD OF ESTIMATING CIRCULATORY EFFICIENCY IN THE LEGS

The condition is always bilateral in thrombo-angiitis obliterans, but the leg more severely affected always halts the patient, so that he is not aware of the condition of the other leg. It is a peculiar and constant observation that when the second leg does give symptoms, the arterial occlusion progresses much more rapidly than on the side first affected.

It is important, therefore, to estimate the condition of the circulation in both legs, and especially when considering sympathectomy operations for thrombo-angiitis obliterans. The chief anxiety of the surgeon who is called upon to advise for or against sympathectomy in a case of thrombo-angiitis obliterans, lies in the difficulty he has in estimating just how far the circulation of the limb is depreciated.



The apparatus in use.

The rate of appearance of rubor in the dependent and of blanching in the elevated position will afford some guide; the more rapidly these things happen, the worse is the circulation. Such a guide is, however, at best a rough one. The effect of a spinal anæsthetic in raising the surface temperature of the limb is apt to be misleading since a rise of skin temperature bears no necessary relation to the amount of blood which may be entering the muscle bellies. The patient's own account of his symptoms is of small value, vitiated as it is by differences of level and of speed. Prof. E. D. Telford suggested that some simple form of ergometer might supply the information required and in a numerical form. Accordingly the apparatus here illustrated has been erected and used in several cases. It consists of a simple ergometer made out of a single inclined plane foot-splint with a hinged foot-piece.

In our experiments we have used a weight of 5 lb. and governed the rate of the exercise by a metronome working at 60 beats per minute. The foot is fully elevated at one beat and depressed at the next so that the weight is raised 30 times per minute. Difficulty in counting the beats is avoided by timing, and half the time, expressed in seconds, gives the number of elevations of the weight. This is the figure that we have used to express the results. We incline the leg piece at an angle of 20° with the idea of ensuring an adequate venous return so that our estimation is directly concerned with arterial flow. It is necessary to prevent the patient raising the thigh from the splint. Flexion at the knee and the use of the thigh muscles must not be allowed. This is secured by the use of an adjustable arch of Duralumin, so arranged that no constriction falls on the thigh. It is also advantageous to give the patient a loop of bandage to hold on to the apparatus so that he keeps his foot squarely planted against the foot-piece. Reviewing the results we find that a normal man can elevate the weight easily 150 times without discomfort. He then notices a dull ache about the instep and calf which does not progress in severity and which does not prevent him from carrying on for 250 times, or more.

THE TEST IN ACTION

The cases of intermittent claudication studied have been due to thrombo-angiitis obliterans and here the result is quite different. In some cases, shortly after commencing the exercise, a sudden pallor of the foot has been noticed, followed by pain in the instep and lower third of the calf. A rapid increase in the severity of the pain occurs with short, rapid, irregular excursions of the foot, until the movement ceases, the patient stating that the pain prevents continuation of the exercise. The pain is exactly similar to that which he experiences on walking. We have always tested the more affected limb first, unless there has been any contra-indication such as gangrene, or ulceration extending on to the plantar surface. The patient has been surprised to find that testing of his supposedly good leg has produced very little better results than those shown on the side of which he was complaining. A typical case is as follows:—

A blacksmith's striker, 45 years of age, well built and six feet in height, developed phlebitis in the superficial veins of the calf of his left leg during August, 1934. He was confined to bed for a month and, during his convalescence, noticed that cramp-like pains appeared in the calf of his left leg if he walked some fifty yards. After a rest of 5–10 minutes he could resume walking, only to be stopped again by the cramp, after continuing a further fifty yards. For about a year before the attack

of phlebitis he had noticed a similar pain in the left leg, but only following a long walk, or towards the end of a busy day. The right leg never troubled him and he had no rest pain.

He came for examination in January, 1935, and then could only walk about ten yards before the pain appeared in the left calf. Both feet showed a moderate degree of rubor, particularly the left. Raising the legs to 45° caused blanching of both feet in thirty seconds and again the blanching was more severe in the left foot. No pulses were palpable in either leg, but the thighs showed weak popliteal and superficial femoral pulses on either side. On both sides there was present a good, strong common femoral pulse. The blood pressure was 124/85, the Wassermann reaction was negative, and general examination revealed no other abnormality. The result of the claudication test was as follows:—

		Plantar flexions.		Remarks.
Left leg	..	{ 25 ..		Pain commencing.
		{ 37 ..		Unable to continue.
Right leg	..	{ 57 ..		Pain commencing.
		{ 75 ..		Unable to continue.

This case may be taken as one of typical thrombo-angiitis obliterans of moderate severity, likely to give a satisfactory result after lumbar cord ganglionectomy. This satisfactory result was indeed obtained as is shown by the readings given by the claudicometer ten months after operation.

		Plantar flexions.		Remarks.
Leg leg	...	{ 130 ..		Pain commencing.
		{ 150 ..		Continuing, but some difficulty.
Right leg	..	150 ..		No discomfort of any kind.

The method appears capable of expressing as a definite figure what one may call the circulatory value of a limb, and particularly is it valuable in assessing the condition of the leg less affected and of which the patient is not complaining. It is likely, as cases accumulate, that this simple method will afford a means of recording results much more accurately than is now done. It is obvious that terms such as "good," "fair," "improved" depend too much on the personal equation of both patient and surgeon to be of much value as clinical records.

SUMMARY

The symptoms of intermittent claudication are briefly reviewed and a simple ergometric method is described by which the severity of this symptom, and its progress after sympathectomy, can be conveniently estimated.

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TRAINING WOMEN FOR CITIZENSHIP OVERSEAS.—Last year the Royal Empire Society held its first experimental course for the training of women in citizenship overseas. The imperial studies committee of the Society and the Empire Citizenship Training Council have now joined to put the scheme on a permanent footing and the next course will begin on May 1st. It will comprise a description of the history, constitution, and races of the Empire, and lectures on household management and social services, and how these may be adapted to conditions overseas. Further information may be had from the secretary at 17, Carlton House Terrace, London, S.W.1.

LUMBOSACRAL STRAIN

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FEW nowadays deny the possibility of such an entity as lumbosacral strain. The pendulum indeed has swung too far in the opposite direction, and the condition is diagnosed too often. Only a greater knowledge of its aetiology and clinical features will enable us to give strain its true significance.

THE CAUSES OF STRAIN

To understand how lumbosacral strain is produced, a knowledge of the anatomy and mechanics of the lower spine is essential. As these have already been described in several papers,^{20 21 26 27 46 55 68} this aspect of the problem will not be considered here.

Acute lumbosacral strain may be caused by a sudden blow forcing the junction into positions beyond the normal limits of its mobility, by an effort to prevent some heavy article from falling, or by a sudden movement of the body in attempting to regain lost balance; the spinal muscles are caught off their guard and the ligaments sustain the full force of the injury. The ligaments and the surrounding muscles are stretched or torn, the synovial membrane and articular cartilages of the lumbosacral interarticular joints are bruised, and the corresponding intervertebral disc suffers. One or other of these structures may be predominantly affected, and all gradations of severity are encountered. Acute strains may also be caused by lifting a heavy weight with the body in a slightly bent position, the stoop accentuating the sacral obliquity and increasing the shearing stress at the lumbosacral junction. Another cause is the failure to provide support for the lumbar spine during an operation under a general or spinal anaesthetic or during a debilitating illness, when muscle relaxation and weakness throw additional strain on the ligaments.

After a heavy fall on the buttocks or feet, complaint is often made of low back pain which is sometimes due to lumbosacral strain, although this diagnosis cannot be confirmed until enough time has elapsed to exclude a possible vertebral crush-fracture. The momentum of the falling body, when suddenly arrested, produces a strong downward thrust at the lumbosacral junction, and the patient will be fortunate if he sustains no more serious injury than a strain. Sometimes the lumbosacral angulation is found to be increased after such falls, and nerve features suggestive of irritation or injury may be discovered. It has been suggested that the increased prominence of the junction causes tension on the fourth or fifth lumbar nerves as they pass downwards in the lumbosacral cord to join the sacral plexus, but it is more probable that they are involved in peri-articular exudate.

Diseases or deformities of the lower extremities interfere with the gait, posture, and body balance, and occasionally give rise to lumbosacral or intervertebral strains. Employment necessitating a continual stooping or semi-stooping posture increases lumbosacral shearing stresses and throws great strain on the back muscles, which become fatigued and leave the ligaments to bear most of the load. Working with one foot higher than the other for a long time is said to be the chief aetiological factor in many cases of strain in surgeons and dentists, but this danger may be averted if the foot is kept in the elevated position only for short periods, or if the feet are elevated alternately. It is doubtful if the wearing of

high-heeled shoes is a common cause of low back strain. The tilt produced is mainly compensated for by extension at the ankle-joints and to a lesser degree at the hips, and there is little evidence that a lumbar lordosis of sufficient degree to cause ligamentous strain is produced; the mechanism of the foot is more liable to suffer than the lower spine. Postural and static derangements produce their evil effects by necessitating the prolonged use of the various spinal articulations in abnormal positions, and, just as an unevenly fitted hinge suffers from excessive friction, so do joints suffer from repeated minor injuries caused by working in unusual or extreme positions.

An increase in the weight of the abdominal contents interferes with the body balance, and throws increased strain on the lower spine, the additional weight pulling the trunk downwards and forwards and displacing the centre of gravity anteriorly. To bring the centre of gravity back to a more normal position, the lumbar spine assumes varying degrees of lordosis, while the back muscles contract more powerfully to sustain the additional weight and to maintain the lumbar lordosis necessary for equilibrium. When the body is erect, these muscles are in a state of postural tonus. Normally this can be maintained almost indefinitely and without voluntary effort, for the muscle-fibres act in relays, and when one set is in action the others are quiescent or recovering. A great increase in the load borne by the back muscles upsets the posturing mechanism by throwing an abnormal strain on the muscles, and the lumbar lordosis present in such cases shortens the muscle-fibres so that their power of contraction is decreased according to the well-known physiological law. Neurasthenia, excessive mental work, and worry have also been blamed for upsetting the delicate proprioceptive reflexes which govern the maintenance of posture. In whatever manner the mechanism is upset, the end-result is the same—a certain amount of voluntary muscular effort becomes necessary, and this, in contradistinction to postural contraction, rapidly leads to muscle exhaustion and relaxation so that the ligaments have to bear more strain than usual. Should the muscles be weak or atonic for any reason, fatigue and strain are even more readily induced.

Goldthwait,^{26 27} who did much pioneer work on the genesis of back strains, distinguished two types of persons who are particularly liable to suffer from low backache.

(1) The visceroptotic, with poor muscular development, a long narrow back, a flexible spine often showing lumbar lordosis, and a sharp lumbosacral angle. This type seems to be specially subject to sacro-iliac strain.

(2) The exact opposite—a heavy individual, with a short thick-set body, limited mobility of the lumbar spine, and a varying degree of lumbar lordosis.

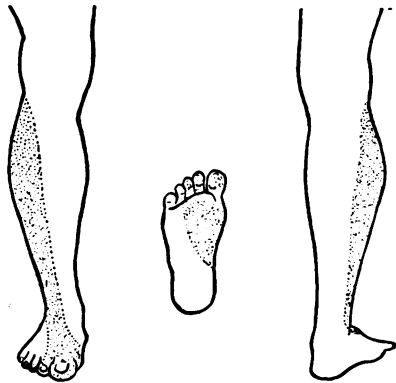
In this second type lateral bending in particular is limited, but all spinal movements are restricted. The vertebral bodies and articular processes are large, the latter having crescentic facets, whereas in the first type the vertebral bodies and articular processes are smaller and the articular facets are flattened. These bony differences explain the variations in the spinal mobility in the two types. Goldthwait's second type is supposed to be specially liable to lumbosacral strain.

SYMPTOMS

The chief symptom in lumbosacral strain is low back pain and the onset may be sudden and acute or chronic and insidious. In acute strains the patient

often volunteers the information that, while he was lifting a heavy weight or making a sudden movement, he felt something snap and immediately experienced pain in the lower back. The pain may be intense and localised at first, but later it becomes less severe and persists in a milder form for a variable period. Movement of the back increases the pain. Deep breathing and expulsive efforts produce the same effect, and Heald²⁹ suggests that this is due to tearing of the quadratus lumborum and its anterior fascial covering near their attachment to the iliolumbar ligament as a result of a sudden contraction in an asymmetrical position. This may occur alone, or in association with lumbosacral articular injury, and is likely to be unilateral. The pain is explained by the fact that the quadratus lumborum muscles contract during expulsive efforts in order to steady the lower ribs, and the diaphragm arises partly from the external arcuate ligaments, which are thickened parts of the anterior fascial coverings of the quadratus lumborum muscles.

Sometimes the pain is completely confined to one side, and radiates along the branches of the great sciatic nerve. The lumbosacral articular structures



The commonest sites of referred pain and of hyperæsthesia in lumbosacral strain.

are supplied by the fourth and fifth lumbar nerves, and the anterior and posterior divisions of the fifth lumbar nerves are in close anatomical relationship to the articulations. Therefore pain may be either of the referred variety due to irritation of the articular nerve-endings, or may be caused by direct compression of the fifth lumbar nerve by periarticular œdema or hæmorrhage; at a later date the same effect may be produced by adhesions, ecchondroses, or osteophytes. The distribution of the pain corresponds with the cutaneous areas supplied by the fourth and fifth lumbar nerves, the fifth nerve areas being more often involved than the fourth. (See Figure.)

Effective treatment quickly relieves the pain but, if it is inadequate, the condition passes into a sub-acute or chronic stage with intractable backache which is aggravated by hard work, trauma, or climatic changes. In chronic cases the pain is more diffuse than in acute cases, and all have varying degrees of disability. Patients with increase or decrease in the normal lumbar curvature often have severe pain in the early stages of their deformity when the ligaments are stretching, but as the deformity becomes more pronounced the pain becomes progressively less, till in advanced cases it may be absent. The patient then describes his condition as a weak back because, although the pain goes, a feeling of weakness persists. Others lose all their symptoms and imagine they are cured. This type of case has been compared to the early and late stages of flat-feet. In the early stages pain is often severe, but as the ligaments stretch further the pain gradually decreases, till in the late stage with complete flattening it may be entirely absent.

The symptoms may be out of all proportion to the injury sustained, especially in middle-aged and elderly persons who already have a pathological condition, such as osteo-arthritis, affecting the lower spine. Until the time of the injury the disease may have been entirely latent, and there may be difficulty in deciding whether the symptoms and signs are due to the osteo-arthritis, or whether the clinical features are due to the combined effects of strain and osteo-arthritis. In many cases, even with the most complete examination, no definite decision can be given. In younger persons a congenital abnormality may account for disproportionately severe symptoms, while in others a functional element may be present. In a few malingering may be suspected, but the consensus of expert opinion appears to be that this is comparatively rare.

SIGNS

The patient may conform to one or other of Goldthwait's types. A pendulous abdomen is a common finding, and distension due to cœsis, cysts, or tumours may be discovered. Owing to the depth of the lesions, swelling and discoloration in the lumbosacral region are rare even in acute cases. Deformities of the lower limbs or spine and faulty posture should be noted. The spine may show a lumbar lordosis, and, in cases with unilateral pain, there is often a slight scoliosis to the unaffected side which relieves pressure on the injured joints and widens the intervertebral canals on the affected side, thus diminishing the possibility of pressure on nerves.

Palpation of the lower spine yields valuable information in all cases. Pressure over the spinous processes of the last lumbar or first sacral vertebra, or in the space between may elicit tenderness, but more commonly deep pressure over the regions of the last lumbar transverse processes is necessary before pain is produced. The tenderness is usually greater on one side and occasionally is completely unilateral. In thin persons, deep abdominal palpation may elicit tenderness over the anterior aspect of the lumbosacral junction. A functional element or malingering should be suspected if the patient is inaccurate in the location of points of tenderness, and if he contradicts himself during the same or subsequent examinations. If one is in doubt, the following manoeuvre is often valuable. The hand is placed on the tender region and the patient is asked to lean backwards. As he does so, the hand exerts increasing pressure and in a genuine case the patient soon recognises this, but a malingerer may be so concerned in retaining his balance that he fails to realise that he is now withstanding considerable pressure on a region which a short time before was sensitive to the slightest touch. This test loses much of its value if a neurasthenic element is present, for in traumatic spinal neurasthenia a paradoxical response to light and deep pressure is well known.

In chronic cases pressure over the various points mentioned may cause discomfort rather than actual pain, and this discomfort is usually greater if the pressure is applied when the patient is stooping. Spasm and tenderness of the lower back muscles are common in acute cases. The former is of a reflex protective nature, while the latter is due partly to muscular hyperalgesia and partly to tearing of muscle and aponeurotic fibres.

Neurological examination may reveal tenderness over the course of the great sciatic nerve, and hyperæsthesia along the antero- and posterolateral

aspects of the leg or ankle, or about the sole of the foot. If it is bilateral, one leg is commonly more affected than the other. Muscle wasting, hypertonicity, or atonicity are slight or absent, and the tendon reflexes are normal; if they are abnormal, it is probable that lumbosacral strain is not the only lesion present. I cannot agree with those writers who claim that the first sacral nerves supply branches to the lumbosacral articulations, and who therefore assume that changes in the tendo-Achillis reflexes, and referred pains in the area of cutaneous distribution of one or both first sacral nerves, are possibilities in uncomplicated lumbosacral strain. Attention might be drawn to another common mistake, that the posterior divisions of the fifth lumbar nerves supply the skin over the lumbosacral region posteriorly, so that referred pain and hyperæsthesia are present in this area in cases of lumbosacral strain. The posterior divisions of the last two lumbar nerves end in the muscles and never reach the skin, and it is muscular hyperalgesia and not cutaneous hyperæsthesia which is present.

An investigation of the lower spinal movements reveals interesting changes, though it is necessary to recollect that the degree of spinal mobility varies greatly even in normal individuals. In acute cases muscle spasm interferes with both flexion and extension, whether the patient is standing, sitting, or lying, and whether the movements are actively or passively produced. Likewise lateral bending of the lower spine is impaired, but it is often freer towards one side than the other. In these cases the symptoms and signs are mainly or completely unilateral, and the freer movement occurs away from the affected side. If the patient is asked to bend in various directions, he usually holds his lower spine immobile and assumes the desired position by movements at other joints. Heald²² states that when one quadratus lumborum muscle is torn the patient, when lying supine, cannot raise both legs simultaneously if the feet are placed six inches apart.

Rectal examination is negative in uncomplicated cases of lumbosacral strain, unless the sacral promontory can be reached, when slight pain may be produced.

RADIOGRAPHIC APPEARANCES

In acute uncomplicated lumbosacral strain radiography shows nothing abnormal, but in chronic cases partial ossification of one or both iliolumbar ligaments is occasionally seen and osteo-arthritis changes are not uncommon. Lateral views show the type of lumbar curve, and, if there is much lordosis, the spinous processes may be seen impinging on each other. Congenital anomalies about the sacrovertebral junction should be looked for and the size of the lumbosacral angle estimated. Since the arrangement of the lumbosacral articular processes is very important, Berry⁶ has devised a special radiological technique to determine the angles at which these processes are set so that any asymmetry can be detected.

DIFFERENTIAL DIAGNOSIS

Fractures or dislocations in the lumbosacral region must be excluded, and, as radiographic evidence of a vertebral compression fracture is often delayed, several examinations may be necessary before a positive opinion can be given. Good lateral radiograms are essential to differentiate between lumbosacral strain and early cases of spondylolisthesis.^{43 45} In a case of suspected strain X rays may reveal other

pathological changes, such as osteo-arthritis, tuberculosis, primary or secondary neoplasms, or gonococcal spondylitis, the symptoms being due to a flare up of the previously quiescent disease. Rarer conditions, such as acute osteomyelitis, "typhoid spine," gummatous osteitis, osteomalacia, osteitis fibrosa, osteitis deformans, and tumours of the cauda equina and meninges are less likely to cause difficulties in differential diagnosis. Low back pain is occasionally the earliest symptom in disseminated sclerosis and tabes dorsalis, and the referred pain in the legs and feet in cases of strain may be mistaken for sciatica, while the hyperalgesia of the lower spinal muscles may be suggestive of fibromyositis, the true underlying lesion being missed. Sometimes lumbosacral strain may simulate diseases of the kidney, appendix, uterus, or other viscera.

Congenital anomalies such as spina bifida occulta, interarticular neural arch defects, sacralisation or lumbarisation, may predispose to strain or cause similar symptoms. Incomplete sacralisation or lumbarisation gives rise to most difficulty in diagnosis and unilateral symptoms and signs in such a case suggest that the congenital abnormality may be the cause of the trouble. Spina bifida occulta may cause characteristic nerve features, but local signs are slight and spinal mobility is scarcely affected. Interarticular arch defects of the fifth lumbar vertebra undoubtedly predispose to strain, and it is impossible to separate the symptoms of the former from the latter.

Finally there is the problem of differentiating lumbosacral from sacro-iliac strain. In a certain proportion of cases, variously estimated, at from 8-33 per cent., a condition of combined pelvic joint strain exists. In the others the history, physical examination, and radiographic findings must be considered in every detail, as the diagnosis can be made only by piecing together scraps of evidence which by themselves would be inconclusive, but which, when taken together, make a complete case incriminating one or other joint.

Exact information should be obtained regarding the onset of symptoms. The occurrence of a snap or "giving-way" sensation is important, and one should discover the exact site of the initial pain and whether it radiated. The attitude of the patient at the onset, and the position of maximum comfort should be ascertained; a patient with sacro-iliac strain is usually most comfortable when lying in bed on his unaffected side; a patient with lumbosacral strain when lying on his back with a support under the lumbar spine. Valuable information is obtained by watching the patient walking, standing, or attempting to climb stairs. The short deliberate steps to avoid any jolt or jar, the tendency to climb stairs like a man with an artificial limb, and the habit of standing with one leg bearing most of the weight and with the other leg slightly flexed at the knee are very characteristic of a sacro-iliac condition, but do not absolutely rule out lumbosacral disease. Great stress cannot be laid on alterations in the spinal curvature, but a lordosis is more common in lumbosacral and a scoliosis in sacro-iliac conditions.

Pain and tenderness confined to the lumbosacral or sacro-iliac regions are of the utmost significance, but the proximity of the two areas, and inaccurate localisation on the part of the patient, may cause errors in diagnosis. Radiating pains or paræsthesia are commoner and more extensive in sacro-iliac cases and are felt along the posterior aspects of the thigh and leg, the outer side of the leg, ankle, and foot,

and the posterior third of the sole of the foot. In lumbosacral derangements posterior thigh pains seldom occur, but the distribution of the leg pains closely resembles that found in sacro-iliac cases. Referred pains confined to the outer border of the foot and the heel are more often secondary to sacro-iliac conditions, but, if they are confined to the toes, anterior part of the sole, and inner half of the foot, they are more often due to lumbosacral disease. Posterior thigh pain, if present alone, usually indicates a sacro-iliac condition, while pain referred entirely below the knee suggests lumbosacral strain. Other causes of radiating pain must be excluded. Wasting of the gluteal, hamstring, or calf muscles, or interference with the tendo-Achillis reflex, are rare in lumbosacral but common in sacro-iliac disease, and in the latter Gratz's bimanual method of examination²⁸ may elicit tenderness about one or other sacro-iliac joint. X rays are not of much diagnostic value in acute cases, but in chronic cases they may show partial ossification of the iliolumbar ligaments or arthritic changes affecting either the sacro-iliac or lumbosacral regions.

Forcible lateral pressure over the iliac crests causes pain in all cases of acute sacro-iliac strain and in many chronic cases, but seldom produces pain in lumbosacral strain. Pressure backwards over the symphysis pubis usually aggravates the pain in sacro-iliac but not in lumbosacral strains. Forced flexion, abduction, and external rotation at one hip-joint separate the innominate bones, cause movement at the sacro-iliac joints, and produce pain in cases of sacro-iliac strain (Smith-Petersen's⁶³ "cross-leg" test.) Hyperextension at the hip-joint rotates the innominate bone on the same side and accentuates the pain of sacro-iliac strain.

In Gaenslen's²³ test, the patient lies supine near one edge of a bed or couch. The leg further away from the edge is acutely flexed at the knee and hip till the thigh touches the abdomen, and the patient then holds the limb firmly in this position with both his arms, thus immobilising the lower spine. The other leg is allowed to hang down over the edge of the bed and it is pressed down till the tension on the ilio-femoral ligament and the muscles attached to the anterior superior and inferior iliac spines causes the innominate bone to rotate on the sacrum. In sacro-iliac strain both local and referred pains are produced, and, by performing the test on both sides, it is possible to tell which joint is affected.

It has been claimed for all these tests that they will differentiate between lumbosacral and sacro-iliac conditions, but this is doubtful. The movements of the innominate bones may irritate a strained iliolumbar ligament or a torn quadratus lumborum muscle, which are occasional complications of lumbosacral strain, and low back pain may be produced in this way. Moreover, in Gaenslen's test, the acute leg flexion straightens out the lumbar spine, and this in itself may cause pain in a case of lumbosacral strain. Thus none of these tests is absolutely diagnostic, though the evidence they supply is very valuable when studied in conjunction with other findings.

The "straight-leg-raising" test is performed with the patient supine.

One hand is placed under the lumbar spine, and with the other hand first one leg and then the other is raised, keeping the knee extended; the hamstrings tighten and exert an ever-increasing pull on the tuber ischii, first causing rotation of the innominate bone on the same side, then tilting the whole pelvis backwards, and finally straightening out the lumbar curve.

Movement is first produced at the sacro-iliac joint on the same side, soon followed by movement on the opposite

side, and finally by movements at the lumbosacral and lumbar joints. Thus in unilateral sacro-iliac strain, the leg on the same side cannot be raised as high as the leg on the opposite side before pain is produced; while, if lumbosacral strain is present alone both legs can be raised higher, because pain is absent until movements occur at the lumbosacral junction. The commencement of movement in the lower spine can be felt by the hand placed under it, and it is easy to tell if pain occurs before or after spinal movements begin. If pain is caused before spinal movements begin it suggests involvement of the sacro-iliac and not the lumbosacral region, although even at this stage movement of the innominate bones might irritate a damaged iliolumbar ligament or quadratus lumborum muscle. Pain coming on after the lumbar spine begins to move is more likely to be due to lumbosacral strain. The exact site of the pain affords valuable additional help in locating the affected joint.

Active and passive spinal and hip movements are examined when the patient is standing, sitting, and lying, and they may be altered in such a characteristic way that they provide valuable diagnostic data. As for the others, the degree of mobility in different people, in the two sexes, and at different ages, is so variable that there is no standard by which one can judge whether the range of spinal and hip movements is diminished. In the erect position, forward bending of the trunk is limited and causes pain in both forms of strain. If the patient sits down, forward bending becomes comparatively free and painless in sacro-iliac strain, but this is not so in lumbosacral cases. A sufferer from sacro-iliac strain stoops by combined flexion of the spine and hips until the hamstrings become taut. The movement is then arrested because of pain in the affected joint and can be continued only by flexing the knee on the affected side to relax the hamstring tension. A patient with lumbosacral strain stoops forward by flexing the hips and knees, and the lower spine is held as rigid as possible. Lateral flexion of the spine is less restricted in sacro-iliac than in lumbosacral strain. Smith-Petersen⁶³ has found that passive flexion of the lumbar spine, produced by the examiner flexing the knees and hips while the patient is in the supine position, is much more likely to cause pain in lumbosacral than in sacro-iliac cases because the pelvis tends to move as a whole, thus eliminating movement at the sacro-iliac joints. All these signs and tests considered individually are inconclusive, but they may fit in with others just as pieces fit into a jig-saw puzzle, until a clear picture is evolved from the scattered fragments.

TREATMENT

During the acute stage rest in bed for 2-6 weeks is essential. In the early stages sedatives may be necessary to relieve the pain, and hot fomentations or cold compresses are soothing. The patient should lie on a firm bed, but soft pillows placed under the knees and the lumbar region often give relief. If the pain persists, the back should be strapped with 3-in. wide adhesive plaster, one layer being applied obliquely and another vertically, from the level of the lower dorsal spine to the trochanters; anteriorly the strapping should not extend further than the lateral abdominal lines. In a severe case the patient should be nursed on a posterior plaster shell.

When the acute symptoms have subsided, local massage should be commenced and physiotherapeutic measures instituted. These aid in the absorption of effusion, relieve discomfort and stiffness, and expedite repair. Ultra-violet radiation, radiant heat, radiotherapy, ionisation, or diathermy may be

employed either alone or in combination, and seldom fail to produce a beneficial effect. Graduated passive and active movements should be commenced in six or seven days, or earlier, and should be continued until full movements are allowed in the sitting or recumbent position by the end of 10-20 days, according to the acuteness of the symptoms. These movements prevent the formation of periarticular adhesions which are so often the cause of persistent pain and disability. Deep-breathing exercises in bed are advocated by one or two writers. In the severer cases the patient should be provided with a plaster jacket, or a properly fitted back brace, when he is allowed up; women prefer strong, specially made corsets. The corsets or back brace should be worn during the day for three months to allow of complete healing of ligaments, but the prolonged use of a brace is necessary only in exceptional cases. A course of remedial exercises to strengthen the back and abdominal muscles and to correct postural defects should be prescribed, and these have been advocated as a prophylactic measure after childbirth. Women should be advised to avoid pregnancy for at least a year after an acute lumbosacral strain.

In chronic strain, rest in bed for a short period at the commencement of treatment is beneficial, and physiotherapeutic measures are as important as in acute strain. The patient's general health should receive attention, constipation is treated, and septic foci are eradicated. Large abdominal neoplasms or cysts are removed, and obese patients or those with pendulous abdomens should be put on a suitable diet and fitted with an abdominal support. A back brace is not always necessary or advisable as it focuses the patient's attention too much on his weak back, but, if the pain and disability are considerable, and especially if the patient's work is arduous, there should be no hesitation in prescribing one. Faulty posture should be corrected, and if it is due to any remediable cause, such as a deformity of a lower limb, this must be treated by operation, or by a suitable orthopaedic appliance. The patient should be warned against heavy lifting and against working in awkward positions for prolonged periods.

Persistent pain and stiffness often point to adhesions interfering with the joint action or pressing on nerves or nerve-endings and no amount of heat, diathermy, or ionisation will affect them. Manipulation to break down the adhesions, followed by careful after-treatment to prevent their recurrence, is the logical remedy. The recognised treatment for persistent stiffness in a knee or shoulder after an injury is manipulation, but the application of similar measures to a stiff spine following trauma has not received the same wide recognition. Riches,⁵⁴ working under Bankart at the Middlesex Hospital, claims that manipulation is successful in 90 per cent. of cases with chronic back strains, and "where there is evidence of definite exciting trauma, success may be anticipated in almost all cases." He adds, however, that the improvement in cases of lumbosacral strain is not always permanent, although the permanency or otherwise of the relief is largely dependent on the efficiency of the after-treatment. The method of spinal manipulation described by Jones and Lovett⁵² in their treatise on "Orthopaedic Surgery" is the best. A general anaesthetic is given, the knees and hips are acutely flexed in order to control the pelvis, an assistant steadies the shoulders, and the pelvis is moved in various directions until complete flexion, extension, lateral flexion, and rotation of the spine are produced. Before manipulation is performed

recent radiograms of the lower spine must be examined to exclude other pathological conditions.

Finally we have to consider the type of case where efficient conservative treatment and even manipulation fail to give relief. This may be due to neurosis or to mechanical imperfections at the lumbosacral junction, such as articular processes arranged in the sagittal plane, interarticular neural arch defects, or an almost horizontal sacrum; in other cases the intractable symptoms are caused by superadded disease, and this must be treated. The patient may be so miserable and disabled that operative treatment becomes a necessity, but this should not be undertaken until conservative treatment has had a fair trial, and gross arthritic or other pathological changes negative operation in the opinion of most surgeons. In selected cases stabilisation of the lumbosacral region by Hibbs', Albee's, and other operations has given good results. A successful fusion operation effectually prevents lumbosacral strain by ankylosing the junction, and by shifting the point of weight transmission to a higher spinal level, which is mechanically more stable and less liable to strain. Chandler¹⁷ has devised a method of "triacral fusion" suitable for cases with combined pelvic joint strains, and Rich's⁵³ operation for stabilising the lower spine is designed for a similar purpose.

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TREATMENT OF DYSMENORRHOEA BY ALCOHOL INJECTION

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IN spite of the research, more or less scientific, of centuries, dysmenorrhœa still remains one of the most important and interesting problems of gynaecological practice. It is responsible for an appalling amount of physical and mental distress, and is economically a most costly disability, both nationally and individually. There is, of course, no doubt that the majority of the milder cases are amenable to medicinal treatment, and that a considerable proportion of the severer type react favourably to cervical dilatation; but there remains a large percentage of the latter who are unrelieved by any procedure short of sympathectomy, and it is for these that the technique described below has been devised.

RATIONALE

The object of the operation is to block the nerve pathway to the uterus at its nearest accessible point. The portion of this pathway which most conveniently lends itself to external intervention is the pelvic plexus of Lee-Frankenhausner, which concentrates most of the uterine nerve-supply in a comparatively small area. I have elsewhere¹ described this plexus in detail, but its relations are so important in the present connexion that it will be useful here to summarise their more salient features.

The plexus is a bilateral quadrilateral sheet of neurofibrous tissue lying on either side and in front of the ampulla of the rectum. It stretches forward to a point just short of the posterolateral border of the uterus immediately above the cervix, inclining in a plane parallel with the lateral pelvic wall at this level. In other words, the plexus lies obliquely upon the posterolateral part of the floor of the pouch of Douglas just above the corresponding vaginal fornix, its deeper portion, consisting mainly of parasympathetic (nervi erigentes) fibres, being contained within the uterosacral folds.

The internal iliac artery and vein lie somewhat behind and below the plexus, but the uterine vessels are fairly closely related to its lateral surface. This apparently alarming relationship is in reality of negligible importance, for the extreme mobility of the artery allows of its being pushed aside by the injecting needle without injury. In addition, actual puncture of the vessel appears to be relatively harmless (see below).

Medially is the lateral aspect of the rectal ampulla, to which the plexus is closely adapted. The ureter crosses its superior border from without inwards, to be related to its medial border for a short distance.

The pelvic plexus is the junction at which almost all the nerves supplying the uterus converge. From above it receives abdominal sympathetic fibres via the solar plexus, presacral nerve, and hypogastric plexuses, and the sacral parasympathetics (nervi erigentes) enter it from behind. The nerves to the uterus are distributed from its anterior border in the form of several strands.

The nerve-fibres in the pelvic plexus are inextricably mixed and interlaced, though it is true that the two main constituents—sympathetic and parasympathetic—lie in separate dissectable planes. This latter fact, however, is of anatomical interest only,

for practically it is impossible to differentiate the various motor and sensory fibres contained, and in any case the thickness of the plexus allows of very little discrimination by the exploring needle.

TECHNIQUE

With the patient in the lithotomy position, and under Evipan anaesthesia, the cervix is seized with vulsella and retracted towards the left. The right fornix is further exposed with the aid of a flat lateral retractor. A long graduated Gasserian needle is then passed horizontally through the vaginal mucosa at the side of the cervix for a distance of 0.5 cm., and the retractor removed. The needle is now passed backwards and outwards for approximately 1.5 cm. at an angle of 45° to both the sagittal and coronal planes, and guided by a finger in the rectum to a point 0.5 cm. from the side of the rectal ampulla. The needle is then withdrawn for 0.5 cm., and 1 c.cm. of 85 per cent. alcohol injected, the needle point being kept slightly but continually moving. The same procedure is then repeated on the other side.

DIFFICULTIES AND DANGERS

Perforation of the rectum with consequent cellular infection is avoided by making the injection 1 cm. away from that organ, as calculated from the internal finger. Injury to the ureter is prevented by adherence to the technique described, which keeps the needle point lateral to it. The uterine artery, if touched, usually slips away from the needle, but constant movement of the latter is a further safeguard.

Hofstetter² has suggested that the injection of a destructive substance like alcohol into the loose pelvic cellular tissue might cause a local aseptic necrosis. I have not encountered this complication, and experience with alcohol injection elsewhere leads one to regard it as only a very remote possibility.

It is unnecessary to use more than 1 c.cm. of alcohol on each side, for only a partial destruction of the plexus is aimed at. It must be remembered that the upper part of the plexus contains the motor nerves to the bladder, which have been shown by Learmonth³ to be indispensable to the proper function of that organ. With the quantity of alcohol suggested, these fibres escape injury, but it is conceivable that larger amounts might damage them, with consequent urinary disorder.

RESULTS

Only 6 cases have been treated over a sufficiently long period to be worth recording, and in 3 of these the success of the method has been vitiated by the fact that a cervical dilatation was performed at the same time. But the ultimate result in all was complete and apparently permanent relief, an effect which appears to indicate the superiority of this operation over the ordinary dilatation, in spite of the small number of cases observed.

The latter procedure, as I have suggested elsewhere,⁴ is really a form of sympathetomy, and owes its effect to the disruption of the sympathetic fibres in the cervix. The amount of this destruction is necessarily variable, depending as it does on the type of cervix, the extent and duration of the dilatation, &c., with the result that it relieves only about 40 per cent. of cases so treated. It therefore seems reasonable to attempt to improve this figure by a less crude and more complete denervation of the whole uterus by alcoholisation of the more centrally placed pelvic plexus, an assumption which is apparently justified in the results recorded.

MODE OF ACTION

The relief of dysmenorrhœa which follows the operation described above may be explained in three ways, viz.:

Interruption of sensory pathways.

“ motor ”

“ irregular ovarian influence.

Interruption of sensory pathways.—The results of sympathetomy suggest, though they do not prove, that the autonomic nervous system is capable of conveying afferent pain-sensory impulses. Normally the contractions of the menstruating uterus are not appreciated by the subject, but when they are exaggerated impulses are transmitted to the sensory cortex, which contains, as Sheehan⁵ has recently shown, the highest central sympathetic representation. It is reasonable, therefore, to suggest the interruption of this sensory pathway as the reason for at least part of the relief following the operation.

Interruption of motor pathways.—It has for a long time been assumed, and Moir⁶ has recently proved, that spasmodic dysmenorrhœa is accompanied by a hypercontraction of the myometrium. The exact mechanism of the pain production is disputed, but the muscle spasm appears to be the main contributory cause. Now almost all the motor nerve-supply to the uterus passes through the pelvic plexus, and it is possible that destruction by alcohol of at least part of this supply might have the effect of abolishing the nerve impulses conveying the impulses to abnormal contraction.

Interruption of irregular ovarian influence.—The work of Blotvogel⁷ and of Kennedy⁸ has shown how completely the pelvic plexus is under the control of the ovarian autocoids; apparently it serves as the vehicle for the transmission of at least part of the ovarian influence on the uterus. Disorder of this influence is probably of primary importance in the causation of spasmodic dysmenorrhœa, and as it acts at least partly through the peripheral autonomic nerves, some of the beneficial effects of intervention on the pelvic plexus may be ascribed to this intervention.

It would appear, therefore, that the relief of pain is the result of interruption of the pathway of three separate and distinct impulses. It is difficult to assess the relative importance of these factors, but it is probable that destruction of the sensory nerves is the predominant one. The reason for this assumption is that unilateral alcoholisation of the parametrium relieves pain on that side only (Blos⁹).

COMMENT

The injection of alcohol for the relief of dysmenorrhœa was first introduced by Blos, of Karlsruhe, in 1929, and has since been practised by him on a good many cases. His technique, however, is quite different from the one advocated above, and consists in the infiltration of the parametrium with 8 c.cm. of 75 per cent. alcohol on each side. This method owes its success to the extensive destruction of the most peripheral uterine nerves, rather than of the pelvic plexus itself, and it seems more reasonable to alcoholise that structure directly in the manner described above. To Blos, however, must be given the credit for the invention of a procedure at once ingenious and practical, and one that is likely to be of permanent therapeutic value.

A modification of Blos's infiltration method has also been used by Young,¹⁰ in the treatment of the syndrome named by him “broad ligament neuritis,”

with excellent results. What is, however, of more importance in the present connexion is the fact that those cases complaining of a coincident dysmenorrhœa were relieved of this symptom by the injection. I have since had the opportunity of demonstrating my technique to Prof. Young, and he agrees that, theoretically at least, it is preferable to Bloss's original method.

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WHOOPING-COUGH

VALUE OF A SPECIFIC VACCINE IN TREATMENT

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FEW therapeutic measures can have given rise to more conflicting reports than the vaccine treatment of whooping-cough. Widely varying doses of whooping-cough bacilli, alone or in combination with other organisms, were used by the early investigators and the results, as might be expected, were equally varied.

In prophylaxis the reported results are excellent and the preventive value of a pertussis vaccine would seem proven. A protective vaccine to have any success must be prepared from the hæmolytic smooth form of the bacillus. Madsen,¹ using a vaccine of this nature, has obtained either protection or attenuation in recent epidemics of whooping-cough on the Faroe Islands. On the other hand, Krueger² believes that mechanical disruption of the bacillary body is necessary in order to avoid possible denaturation. In this way an endo-antigen is obtained and has been successfully used by Munns and Aldrich³ in prophylaxis. It is doubtful whether the results obtained with pertussis antigen are any better than those achieved with the intact bacillus.

Success in prophylaxis has caused a revival of interest and has stimulated further investigations into the value of the newer vaccines or antigens in treatment. Stallings and Nicholls⁴ treated 232 patients in the catarrhal and paroxysmal stage of whooping-cough with undenatured pertussis antigen. Abatement of symptoms appeared to follow, but the experiment was inadequately controlled. It is generally agreed that, if success is to follow vaccine therapy, the initial injections must be given early in the disease, large doses must be injected, and smooth colonies must be used in the preparation of a vaccine. Although such a vaccine has been enthusiastically advocated, the few adequately controlled experiments which have been carried out do not show that it is of any value in the treatment of whooping-cough.

PRESENT INVESTIGATIONS

It should be emphasised that we were not concerned with prevention. An attempt was here made to

assess the value of a pertussis vaccine in the treatment of early cases of whooping-cough. Certain limitations are immediately imposed on such an experiment in hospital practice. It is the general experience that only in severe epidemics are whooping-cough cases admitted to hospital in the early catarrhal stage of the disease. This is probably due to the fact that, during marked prevalence, every cough is regarded with suspicion. In less severe epidemics, on the other hand, suspicion is not aroused until the cough has become paroxysmal or until a whoop develops. During the period of this investigation the epidemic was of moderate severity and, in consequence, early cases were limited to those already in the paroxysmal stage of the disease.

The investigation was conducted along the following lines: (1) Cases of whooping-cough, in the paroxysmal or early whooping stage, numbering 60, were graded according to severity on admission. (2) All the cases received routine treatment such as fresh air and simple drugs when indicated. (3) Half of them received, in addition, a specific pertussis vaccine. (4) In a certain number of cases leucocyte counts were done on admission and in early convalescence.

Classification of severity.—This is admittedly unsatisfactory in whooping-cough. Nevertheless, some classification is necessary for purposes of comparison and the following simple one was used:—

1. Total spasms in 24 hours did not exceed 10. Character of spasms mild—cyanosis never seen.
2. Total spasms in 24 hours exceeded 10 but not 20. Spasms of moderate severity—cyanosis occasionally seen.
3. Total spasms in 24 hours exceeded 20. Severe spasms with cyanosis the rule—convulsions occasionally.

All the cases in this series fell into the first or second group of this classification on admission. No case with a severe respiratory complication such as broncho-pneumonia was included.

Vaccine administration.—The vaccine was prepared from recently cultivated smooth strains of *Hæmophilus pertussis* and put up so that 1 c.c.m. contained 10,000 million organisms. Bacilli used in making the vaccine were of proven virulence on guinea-pig injection, and when used for active immunisation of rabbits could protect them against fatal doses of a virulent culture of the same organism. Alternate cases of similar age and apparent clinical severity were given a routine course of this suspension subcutaneously. A course consisted of 0.2, 0.5, 1, 1.5, 2, and 2.5 c.c.m. at intervals of 2-3 days. It was always possible to complete a course within 14 days of admission.

Reactions after vaccination.—Local reactions consisting of erythema and induration were common but transient. General reactions were rare. Three children had a sharp rise of temperature on the evening of injection, but by the next day the temperature had fallen to normal. A clinical impression was gained that children occasionally experienced an increase in frequency and severity of their spasms during the course of injections. The discussion of the significance of this finding we will leave for the moment.

VALUE OF VACCINE THERAPY

Children of approximately the same age and at the same stage of disease were alternately placed in the vaccine or control series and in this way two groups of cases were obtained. Table I. has been compiled to show the result of this classification. It will be seen in section A of this Table that, as far as age and stage of disease is concerned, the distribution is almost identical. It was hoped that the two

groups would be also identical as far as severity on admission was concerned. Reference to section B of the Table will show that this was not achieved. The distribution is less favourable for the vaccine series as the percentage within the Group 2 classification of severity is greater than that for the controls. This is readily explained by the fact that classification

of the vaccine was a tendency to increase the severity of the spasms and to prolong the whoop beyond the 14-day period during which vaccine was being injected. This effect is in agreement with the clinical impression obtained during this investigation and has been previously recorded by Howell⁵ in an investigation at this hospital. It need not necessarily be interpreted as a result of vaccine per se and might be attributed to a psychological effect. Information on this point could be gained in a future investigation by injecting the control series with small quantities of sterile water.

TABLE I

Showing Percentage Distribution of Cases: (A) according to Age and Stage of Disease: (B) according to Severity on Admission.

Age.	A						B		
	Controls.			Vaccine.			Severity grouping.	Controls.	Vaccine.
	Paroxysmal.	Whooping.	Total.	Paroxysmal.	Whooping.	Total.			
0-1 yr.	10.0	6.7	16.7	6.7	6.7	13.4	..	..	..
1-2 yrs.	13.3	20.0	33.3	13.3	20.0	33.3	1	70.0	50.0
2-5 "	20.0	16.7	36.7	13.3	26.7	40.0	2	30.0	50.0
5-10 "	0	13.3	13.3	6.7	6.6	13.3	..	..	..
—	43.3 100.0	56.7	100.0	40.0 100.0	60.0	100.0	..	100.0	100.0

N = 30

N = 30

was attempted on the actual day of admission, in order that there should be no delay in the administration of vaccine. Early classification of severity in such a variable disease as whooping-cough has obvious disadvantages, and in this case has resulted in a disparity for which allowance must be made in any comparison of results between the two series. Allowance can be made in this way. If it can be assumed that the vaccine-treated cases, distributed according to severity on admission, would experience the same increases in severity after admission as the control series, then the total number of vaccine cases who might be expected to get worse would be 15.23. The actual number was 17 (Table II.). In like manner comparisons can be made between the number of vaccine cases who might be expected to cease whooping at a particular period of the disease and the number who did in fact cease at that period. Reference to Table II. will show that the vaccine cases behaved exactly as might be expected, except in the first four weeks of the disease. Here it is significant to note that approximately five fewer vaccine cases ceased to whoop at the end of two weeks, but that five more than were expected had ceased whooping at the end of four weeks.

It seems reasonable to assume, from the figures given in Table II., that the only demonstrable effect

EFFECT OF VACCINE ON BLOOD COUNT

In conclusion an attempt was made to determine whether the injection of pertussis vaccine had any effect on the leucocyte response in whooping-cough. Of 23 children, who formed the subject of this investigation, 12 had received vaccine and the remaining 11 acted as controls. A leucocyte count was done on admission and repeated 14 days later—i.e., at the usual termination of a vaccine course. It was found that both groups showed leucocytosis and lymphocytosis on admission, but that 14 days later the count had returned to normal irrespective of whether vaccine had been given or not. Thus it was impossible to demonstrate, from these counts, any leucocyte change which could be attributed to the injection of vaccine.

CONCLUSIONS

The position with regard to vaccine treatment, as judged by this investigation, would seem to be clear. The injection in the paroxysmal stage of large doses of a pertussis vaccine prepared in accordance with modern methods and beliefs is shown neither to curtail the duration of the disease nor to ameliorate the symptoms. Indeed the only effect obtained was an undesirable one, although not serious. It is noteworthy that no case in the vaccine or control series was fatal. This, in face of the not inconsiderable mortality which prevailed for the general run of cases in the epidemic, appears to be a potent argument for the early hospitalisation of whooping-cough.

We desire to acknowledge our indebtedness to Dr. R. A. O'Brien, of the Wellcome Research Laboratories, for supplying the vaccine and for information concerning its preparation; and to Dr. E. H. R. Harries, medical superintendent of the North Eastern Hospital, for his cooperation and for his permission to publish this paper.

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TABLE II

SHOWING (1) INCREASES IN SEVERITY, (2) DURATION OF WHOOP, IN CONTROL AND VACCINE SERIES

Severity grouping.	Control series.						Vaccine series.										
	Cases	Increase in severity and per cent.	Duration of whoop.				Cases	Increase in severity.	Duration of whoop.								
			2 weeks.	4 weeks.	6 weeks.	8 weeks.			2 weeks.	4 weeks.	6 weeks.	8 weeks.					
													Act.	Exp.	Act.	Exp.	Act.	Exp.	Act.	Exp.
1	21	12 (57.1)	11 (52.4)	9 (42.8)	1 (4.8)	0 (0.0)	15	12	8.6	5	7.9	8	6.4	2	0.7	0	0
2	9	4 (44.4)	2 (22.2)	4 (44.5)	2 (22.2)	1 (11.1)	15	5	6.6	2	3.3	10	6.7	2	3.3	1	1.7
	30	16 (53.3)	13 (43.4)	13 (43.4)	3 (10.0)	1 (3.2)	30	17	15.2	7	11.2	18	13.1	4	4.0	1	1.7

Act. = actual.

Exp. = expected.

CLINICAL AND LABORATORY NOTES

A SIMPLE TEST FOR GROSS NITROGEN RETENTION IN THE BLOOD

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Andrewes¹ in 1924 described a chemical test on the blood for the diagnosis of uræmia, which aroused considerable interest. Later workers,² assessing the value of this test, concluded that the reaction is found only in uræmia or severe renal inefficiency and stated that the retention of indican does not necessarily run parallel to that of nitrogenous bodies. The following test, which is much simpler to perform, does give results which follow the retention of nitrogenous substances, since a positive reaction is due to an increase in the creatinine fraction of the blood.

Reagent.—Add 25 c.cm. of 10 per cent. potassium iodide to 100 c.cm. of Nessler's reagent.³ Under the conditions of the test, this solution no longer reacts with ammonia or with glucose in the concentration in which it occurs in the blood filtrate.

The test is performed by adding one volume of this reagent to one volume of tungstic acid filtrate from blood. It is considered positive if a definite greyish-white turbidity, resembling milk diluted with water, appear within 45 seconds. The test-tube should be held against a black surface and the temperature of the solutions should be 15–20° C.

Since this test takes two minutes to perform and requires only 1 c.cm. of blood filtrate, it should be a valuable aid to the laboratory analyst. In all positive cases smaller quantities of filtrate should be employed for the determination of urea and non-protein nitrogen, thus preventing ruined analyses due to large quantities of ammonia encountered unexpectedly.

Experiments indicate that the reaction is positive when the creatinine content of the blood is greater than 2.5–3 mg. per 100 c.cm. Blood preserved with formalin cannot be used for this test.

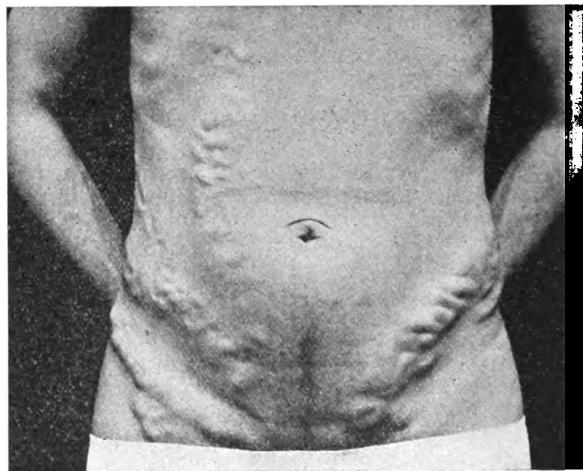
AN UNUSUAL CONTRA-INDICATION TO THE OCCLUSIVE TREATMENT OF VARICOSE VEINS

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In examining cases of varicose veins of the leg I have twice encountered a condition which contra-indicated any attempt at obliteration. Both patients hopefully requested a cure by injection, but had such treatment been adopted it might well have led to disaster for both were suffering from thrombosis of the inferior vena cava. The diagnosis can be made by a glance at the abdomen. The usual practice is to examine the saphenous openings before instituting injection treatment, and the purpose of this note is to recommend that the abdomen also should be scrutinised. Neither of the patients informed me of the condition of the abdominal veins.

The accompanying photograph of one of them shows the enormously dilated, tortuous veins coursing upwards from the saphenous openings to communicate through the superficial circumflex iliac venous system with the lateral thoracic vein, which drains into the axillary vein; on the right side the superficial epigastric vein is dilated and anastomoses with the veins of the thoracic wall. The veins in both the lower limbs were enormously dilated and varicose. A similar picture was presented by the other case. Both patients were middle-aged men and in good health and on further questioning both admitted that the venous enlargements had been present for many years, though strangely enough neither could state accurately the date of onset of the condition; one had been in the tropics for many years and had suffered from "tropical diseases." The commonest causes of thrombosis of the inferior vena cava are infections, especially typhoid fever and puerperal



Abdomen of one of the patients.

sepsis, trauma, or malignant disease of the kidney, suprarenal glands or liver (Pleasants,¹ Kerr²), but neither the history nor the clinical examination of my patients disclosed any such cause of their condition. That they had survived for many years the occlusive effects of inferior vena cava thrombosis with no disability worse than that of severe varicose veins is not exceptional, for Parkes Weber,³ Shattock,⁴ and Kerr² have all reported their experience of cases with long survival and few symptoms.

The appearance in the case illustrated is characteristic of thrombosis of the inferior vena cava; Robinson⁵ has recently published a similar picture. My object here is not to inquire into the pathology and clinical features of this disease, at least 318 cases of which have been recorded, but to indicate the value of looking at the abdomen before embarking on the injection of massive varicose veins of the legs. Sclerosis of such veins by injection must hamper unjustifiably the adequate collateral venous circulation that has been established.

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A VASOVAGAL ATTACK

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Fainting is a common occurrence and usually excites but little comment. Some years ago Lewis^{1,2} drew attention to the slowing of the pulse and the lowering of the blood pressure observed during an ordinary attack of fainting. More recently he³ again stressed these features under the heading of vasovagal attacks and pointed out that most faints in the absence of postural causes and heart-block are in fact vasovagal in origin. The slowing of the heart is due to increased vagal tone and is relieved by the injection of atropine,³ but the lowered blood pressure is an independent phenomenon and presumably due to dilatation of the splanchnic vessels. The combination of these two factors is sufficient to rob the brain of an adequate supply of blood with the result that consciousness is either completely or partially lost.

The other day I had the good fortune to take an electrocardiogram of a patient during a fainting attack.

He was a man of 46 and was known to have suffered from oedema and ascites a few months before I saw him at the out-patient department at the Royal Hospital, but there was no reason to suspect that he had heart-block. (In this connexion it is interesting to note that Lewis³ considers the commonest cause of fainting in cardiac subjects to be the ordinary vasovagal attack and not heart-block.) I had just removed a few cubic centimetres of blood from a vein at the elbow for a sedimentation test. At the sight of the blood in the syringe he became pale and sweated, but did not actually lose consciousness. A few minutes later whilst sitting in the electrocardiograph chair he fainted. The pulse at the wrist was impalpable. With a nurse supporting him I was able to obtain an electrocardiographic record of the vasovagal attack.

Lead I. (Fig. 1) was taken just before he fainted; it shows normal sino-auricular rhythm at a rate of about 70 per minute. The T-wave is inverted. Leads II. and III. (Fig. 1) were taken during the attack. It will be seen that the rate is considerably slowed. In lead II. (Fig. 1) the rate is 42 per minute, no P-wave can be made out, and the R-T interval is prolonged. In lead III. (Fig. 1), whilst he was slowly regaining consciousness, the rate has risen to 52, the P-wave has reappeared but is inverted, and the P-R interval is shortened.

The second electrocardiogram (Fig. 2) was taken within five minutes of the first. By this time he had completely recovered. The heart-rate is 71, 68, and 68 respectively in the three leads, there is no longer any inversion of the P-waves, and the P-R (and R-T) intervals are the same as before the attack.

No blood-pressure readings were taken, but it was noted that the pulse had disappeared at the wrist during the time he was unconscious. The striking features in the electrocardiogram are the disappearance of the P-waves during the unconscious stage and its reappearance, inverted, whilst he was coming round. It would appear that the sino-auricular node was temporarily in abeyance and that the auriculo-ventricular node had taken over its function. Since

the P-wave is completely lost it must be buried in the ventricular complex, and for this to occur the impulse must have arisen low down (anatomically) in the A.V. node at such a point that the auricles and ventricles are stimulated simultaneously (the auricle by retrograde spread from the A.V. node). Presumably with the increase of vagal tone the S.A. node has been thrown out of action and the A.V. node, which is known to possess less inherent excitability, has taken over its function as pacemaker. Equally interesting is lead III. (Fig. 1) in which the rate has risen to 52 per minute and an inverted P-wave makes its appearance. The P-R interval is also a little shorter than in lead I. before the attack had begun. Evidently the impulse is still arising in the A.V. node, but at a higher level such that the auricles are stimulated to contract before the ventricles. The inversion of the P-waves indicates that the spread in the auricle is still retrograde. The second electrocardiogram (Fig. 2), which was taken after recovery, resembles lead I. of the first and denotes complete restoration of sino-auricular rhythm, the level of impulse formation having shifted from the upper level of the A.V. node to the sino-auricular node itself.

CONCLUSIONS

(1) An electrocardiographic record of a vasovagal attack is shown. (2) The slowing of the heart is due to the auriculo-ventricular node having taken over the function of the sino-auricular node as pacemaker. Separate leads show the impulse arising at different levels in the auriculo-ventricular node. (3) On recovery sino-auricular rhythm with its enhanced rate is restored.

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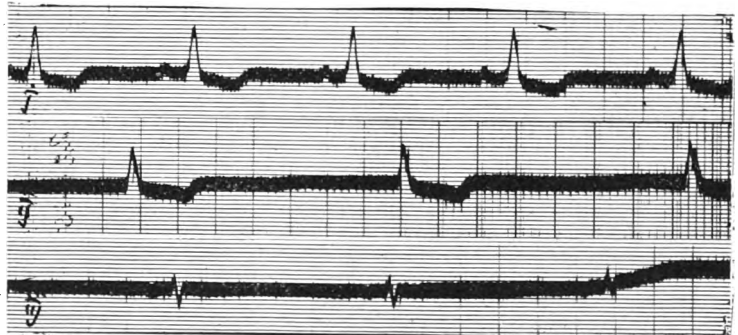


FIG. 1.—Lead I., before attack. II., unconscious. III., coming round.

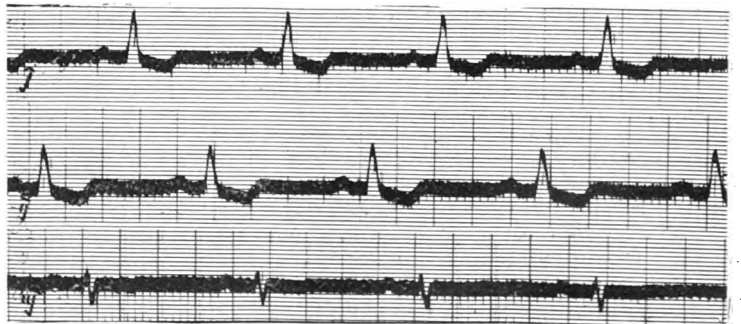


FIG. 2.—After recovery from attack.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF SURGERY

At a meeting of this section on Jan. 1st, Mr. W. SAMPSON HANDLEY, the president, being in the chair, Mr. G. H. STEELE read a short paper and showed a film on

Retrograde Œsophagoscopy

The results of treatment of cancer of the œsophagus were, he said, highly unsatisfactory. Only a few cases could be operated on, because of the age of the patient and the wide spread of the growth, and the operative mortality was enormous. Irradiation treatment could be described as hopeful but no more. The ideal technique seemed to be deep X rays, and some remarkable cases had been recorded, but this seemed to make the patient very ill and sometimes caused fibrosis of the lungs, while the relief granted was only temporary. The application of radium transpleurally had a very high mortality and poor results, while large doses in the lumen were unsatisfactory. The operations of intubation and gastrostomy were purely palliative. Better results were obtainable from insertion of radon seeds through the œsophagoscope. This did not upset the patient and caused no appreciable mortality. In many cases it produced definite healing of the visible upper end of the growth with relief of dysphagia for a period varying from six months to three years. If the lower end were approached from below almost the whole length of the œsophagus became accessible. Both ends of the growth could be irradiated, but the extra-œsophageal spread would have to be dealt with by X rays. The operation, which was shown in the film, was performed with a Jobson's introducer, the œsophagoscope being passed by direct vision. Cures were not claimed, only a great increase of comfort. Of four cases treated from both ends, one had died six weeks later from innominate artery hæmoptysis. At post-mortem the growth was healed in the œsophagus but had extended to the artery. The second patient had lived perfectly comfortably for nine months and then had died of aortic hæmatemesis. In a third case the two operations had been performed simultaneously—perhaps a mistake—and the patient had died of mediastinitis five days later. The fourth was alive and well after six months and having deep X rays for the extra-œsophageal extensions.

Prof. J. PATERSON ROSS said that the technique at St. Bart.'s had been modified to obviate fibrosis of the lung, and asked Mr. Steele how he estimated the depth of the growth. Dealing with it from both ends was a great advance.—Mr. STEELE replied that radiographs taken in the recumbent position gave a fair idea of the extent of the growth. He had not attempted irradiation during the operation.

Mr. T. B. JOBSON complimented Mr. Steele on the advance he had made. Chevalier Jackson had told him he had never had a cure. If only a case could be treated early enough, there was no reason why cure should not be obtained by Mr. Steele's method. The film showed that the radon seeds introduced from below overlapped those introduced from above.

The PRESIDENT commented on the advantage of intra-tumoral methods and thought that a combination of these with deep X rays would be better than the latter alone. The present method also facilitated

gastrostomy, if this were necessary. If the patient refused radiation, pancreatic ferment with sodium bicarbonate by the mouth might give relief in many cases, healing the ulcerated surface and restoring the power of swallowing.

Dr. H. L. MARRIOTT read a paper by himself and Dr. A. KEKWICK on

Continuous Drip Blood Transfusion

The average in 87 cases, he said, was 5 pints and 29 hours, the largest figures being 11 pints and 62 hours. Present conceptions in regard to dose needed revision; a pint was woefully inadequate for an anæmic patient, especially if he were bleeding. The principle should be made one of quantitative measurement and the restoration of a normal hæmoglobin percentage. Hæmoglobin estimations should check the transfusion. Clinical results were commensurate. The necessity for slower administration followed from these large doses. There was, however, more in administration than met the eye. A. E. Boycott and C. L. Oakley, working with rabbits, had shown that large transfusions did not affect the plasma volume; the added plasma was extruded and the added cells retained. This process went on during the transfusion if given slowly enough. The best rate was to try to increase the patient's hæmoglobin by 10 per cent. every four hours—i.e., in the non-bleeding patient, a pint in four hours, or 40 drops a minute. In bleeding patients the rate must be governed by hæmoglobin estimations. If the patients were weak there should be three stages at intervals of a few days. The apparatus had been described fully in THE LANCET (1935, i., 977, and ii., 78). The blood was kept stirred by bubbling through it a slow stream of filtered oxygen. It was important to bleed donors by a closed method, to avoid droplet infection from the operator. On an average four or five donors were used for each transfusion. The great majority had been friends and relatives, as it did not seem right to deplete the Red Cross service for large transfusions. The approach to the relatives was important; the onus of finding ten or twelve donors must be put on them and no responsibility should be taken by the surgeon.

This method had proved extraordinarily effective. Most of the patients had had bleeding peptic ulcers or had needed transfusion before or after operation. Results had been very satisfactory and in some cases remarkable. In peptic ulcer the blood could be run in as it was lost; 18 out of 22 serious cases had lived and at least half of them could not have lived without the massive transfusion. Three of the deaths had been due to pneumonia and one to perforation. Eight cases of aplastic anæmia had been treated, but it was better to transfuse them once a week and not give the blood by the continuous method. Four transfusions had been done during operation, the blood being run in as the patient lost it and the hæmorrhagic element of shock eliminated altogether.

Mr. V. H. RIDDELL demonstrated by slides and a film a technique with an electrically-driven pump and pointed out its advantages and disadvantages. The latter were financial and mechanical. The apparatus cost 60 guineas, was manufactured abroad, and removed all the romance from blood transfusion. It was, however, simple and reliable and there was only a single rubber tube to sterilise. Less tubing was needed than in Dr. Marriott's apparatus, so that

obstruction due to clotting was less frequent. The rate of flow was absolutely constant and could be regulated. The blood could be introduced at body temperature, its container being surrounded by a bowl of water at 108° F. or a thermostat. The transfusion gave itself. The motor was supplied with a gear system and a reverse, and a revolving cam pressed the rubber tubing against the sides of the metal cup in which it rotated. The tubing was first filled with 3.8 per cent. citrate.

Mr. A. H. BURGESS asked whether this country could not do something similar to what was being done in Russia, where large quantities of blood were collected from the vessels of the newly dead. Accidental, suicidal, and cardiac deaths were used for this purpose.

Mr. ZACHARY COPE asked whether citrated blood was as good as other forms, and if there had ever been rigors in long-continued transfusions.

Mr. ROGERS asked what rate was used for children and how blockage was dealt with.

The PRESIDENT said that surgeons could be divided into ritualists and evangelicals; some liked elaborate methods while others sought simplicity. Blood transfusion seemed to be no exception.

Dr. MARRIOTT replied that the point of their work was dose and rate, not apparatus. A pump had advantages only in children; it was difficult to keep a rate of about 5 drops a minute steady by gravity, and the pump was therefore better. Gravity drip must be watched by a nurse, as it might block and cause reflux. The cooling effect in large transfusions was negligible and it was not worth while to warm the blood, with the risk of cooking it. Citrated blood was better than other kinds as the citrate had a hæmostatic effect in the body. Rigors were due to dead bacteria in the saline or citrate, and could be obviated. In the last thousand cases of drip saline at the Middlesex there had been 16 rigors, and ten of the patients had had them before. Stale blood clot in the tubing might also cause rigor, and fresh tubing should be used for every patient.

Mr. C. JENNINGS MARSHALL read a paper on the treatment of

Diverticulitis of the Colon

The condition was, he said, a newcomer to the pathological consciousness, but was nowadays frequently diagnosed clinically. Patients complained of left iliac fossa pain, and an acute attack often started while straining at stool. Local pain, backache, and slight pyrexia characterised chronic cases. The elongated swelling contrasted with the restricted tumour of cancer, which was afebrile and without backache. Gross obstruction was, in his experience, rare in diverticulitis. Radiographically there was a saw-tooth appearance with distortion and rigidity, but the appearance was suggestive only. The causative diverticulum was never seen, because it was obstructed and did not admit the opaque fluid. Stereoscopic radiography was particularly useful in determining relationships and operability. A perforating carcinoma might not infrequently have arisen in a diverticulum. Chronic cases needed very full investigation. The presence of blood and mucus in the fæces favoured cancer but did not prove it.

Acute cases were associated either with abscess or with perforation. Abscesses might be found in the loin or mesosigmoid. The abscess should simply be drained and the condition otherwise left alone. Perforating cases needed pelvic drainage followed by

Fowler's position. The organism was generally a foul proteolytic germ. Fæces were not extravasated in the pelvis to any great extent on account of the obstruction of the diverticulum and the acute swelling surrounding it. There might be extravasation after separation of a slough. Stitching up was more likely to cause extravasation than to prevent it. There was no need to worry much; it was enough to anchor the appendices epiploicæ under the incision and drain. Nevertheless the ideal procedure, when it was possible, was a first stage Paul's operation, as this provided radical cure.

Chronic cases, correctly termed peridiverticular cellulitis, were amenable to careful treatment, but this was prolonged and irksome. The less nocuous lactic-fermenting intestinal flora should be encouraged by a low protein or wholly fruit and milk diet. Intestinal lubricants and lavage should be used to keep the stools soft. Roughage must be excluded. During active exacerbations glycerin per rectum was very useful. Cases should be regarded as "medical until proved surgical." Did diverticulitis, he asked, in fact recur elsewhere after excision? Persistence of pain, fever and obstruction, fistulæ and relapses were the chief indications for surgery. The Paul-Mikulicz method was the preferable one. Colostomy was necessary in severe pelvic matting and vesico-fistula.

Mr. M. F. NICHOLLS agreed that perforation did not cause gross infection and quoted a case in which the peritoneal exudate had been sterile and the diverticula had recovered without local treatment. A curious abdominal catastrophe was very likely to be a diverticulitis.

Prof. PATERSON ROSS spoke of the difficulties and dangers of vesical fistula. In one case a colostomy had been closed after six months and the fistula into the bladder had promptly reopened.

Mr. BURGESS agreed that there was no continuous leakage in diverticulitis any more than in appendicitis, but communication might reopen when inflammation subsided, and go on indefinitely, as it did in vesico-colic fistula. The colon was far more septic in diverticulitis than in cancer, and any attempt to free it was very dangerous. A transverse colostomy was the best operation, and it might have to be postponed for six or twelve months. Any septic part became aseptic if completely short-circuited; therefore the transverse colon must be cut completely across and the ends separated. Eventually any desired operation could be done to clear up the condition.

The PRESIDENT corroborated the suggestion that diverticulitis might end in carcinoma, and said he had also found it to cause obstruction.

ROYAL ACADEMY OF MEDICINE IN IRELAND

At a meeting of the section of medicine on Dec. 13th, 1935, with Dr. V. M. SYNGE, the president, in the chair, a paper on the

Infective Factor in Rheumatic Fever

was read by Dr. W. R. F. COLLIS. He showed charts demonstrating the following points:—

(1) Rheumatic fever follows acute hæmolytic streptococcal throat infections in a high percentage of already rheumatic subjects and in a small percentage of non-rheumatic patients.

(2) Both recrudescences and primary rheumatic attacks follow hæmolytic streptococcal infection only—not other infections.

(3) Rheumatic subjects are hypersensitive to the streptococcal endotoxin.

(4) In every case there is a definite sequence: acute pharyngitis → silent period (10–20 days) → acute rheumatism.

(5) Although the organism disappears from the surface of the pharynx soon after the pharyngitis subsides it can be obtained many months afterwards at autopsy from the centre of the tonsils, from the cervical and mediastinal glands, and occasionally from the spleen.

(6) Hæmolytic streptococci may be divided into biological groups: some of these cause throat infections which precede rheumatic fever; others do not.

(7) The blood of patients with acute rheumatism shows streptococcal antibodies (e.g., precipitins and anti-streptolysin). These are present while the disease is active but are low or absent during good health.

(8) There is a definite resemblance between the arthritis of serum sickness—which follows 10–20 days after injection of horse serum and occurs when the antigen (horse serum) and the antibody (precipitin) reach a certain titre in the patient's blood—and that of the acute rheumatic recrudescence.

Dr. Collis submitted that the infective factor in rheumatic fever is the hæmolytic streptococcus, and that the disease is due to interaction between breakdown products of the organism and the liquids and tissues of the body.

The PRESIDENT said he was interested to note Dr. Collis's remark that antibody production might be delayed by the giving of aspirin, and that this might prevent cardiac complications. If toxin-producing streptococci were the cause of rheumatic fever it seemed queer that scarlet fever should never be followed by the rheumatic type of valvular disease.

Dr. R. E. STEEN was not absolutely satisfied that the hæmolytic streptococcus was the cause of the rheumatic relapse. If a hæmolytic streptococcal sore-throat was the cause of acute rheumatism, it was surprising that one so seldom saw acute nephritis as a complication.

Dr. G. C. DOCKERAY pointed out that the incidence of streptococci in throats was very high.—Dr. L. ABRAHAMSON also referred to cases in which hæmolytic streptococci were present in the throat but the patients had neither clinical sore-throat nor rheumatism. It was sometimes stated that acute rheumatism was seen only in the poor, but this was not altogether true; he saw a good deal of it in private practice.

Dr. ALAN THOMPSON said it was well known that the titre of antibody corresponding to a particular organism might rise in response to any non-specific pyrexia. He thought it quite possible that the clinical exacerbations of rheumatic fever merely stimulated the rise of the streptococcal antibodies. In his opinion the experimental work described by Dr. Collis required considerable amplification before it could be accepted definitely.—Dr. J. C. FLOOD suggested that the work should be carried a stage further by trying to reproduce the lesions in animals.

Dr. COLLIS, in reply, said he fully realised that his hypothesis could not be accepted out of hand. The most important fact established was the association of the hæmolytic streptococcus and acute rheumatism. Criticism had centred chiefly on two points: (1) that the organism was often found in the throat of normal people and often caused acute pharyngitis unassociated with rheumatic fever; (2) that his hypothesis did not satisfy Koch's postulates or the generally accepted principles of disease processes. In reply to the former, he pointed out that the same could be said of nearly all germs found in the nasopharynx; recent work had shown

that many very different organisms are at present included under the wide heading of "hæmolytic streptococci," and in future the mere hæmolysis of blood corpuscles would not be sufficient description for these organisms. As to Koch's postulates he could only say that he thought they were dead. It had been shown that erythema nodosum could in different circumstances be caused by infection with different organisms. A new and revolutionary attitude was needed towards disease, for the reactions of the body were as important as the invading germs in the causation of disease syndromes.

Dr. ABRAHAMSON and Mr. J. OWENS each reported a case of Syphilis of the Lung.

Genital Prolapse

Dr. J. F. CUNNINGHAM's presidential address to the section of obstetrics and gynæcology dealt with the choice of operation in the treatment of genital prolapse. No one type of operation, he said, was effective for every degree and type of prolapse, and the cause of the condition should be carefully investigated in every case. He had found five different operations useful, with occasional slight modification. Simple colporrhaphy and perineorrhaphy was adopted for cases of small cystocele and rectocele when the tissues were good and the fascia capable of being repaired, and where there was no definite prolapse of the uterus. The Manchester operation was used in cases of uterine prolapse of the first or second degree, especially during the child-bearing period; but in patients near or past the menopause, where a large cystocele was the main feature, the interposition operation was preferred as being more certain in the ultimate result. Cases subjected to this operation must be carefully selected and the operation performed with close observance of detail, if unsatisfactory results were to be avoided. Vaginal hysterectomy, after Mayo, or combined with a Manchester colporrhaphy, was performed in cases of complete procidentia; this gave the best results, but attention must be paid also to the repair of the posterior vaginal wall and Douglas's pouch. Finally, Le Fort's operation was occasionally useful in elderly subjects where a more extensive operation might be dangerous. Dr. Cunningham quoted 161 cases operated on for prolapse; 121 by colporrhaphy (including Manchester), 16 by interposition, 19 by vaginal hysterectomy, and 5 by Le Fort's method. There was one death, from lobar pneumonia, and, on inquiry, 7 recurrences had been reported, 3 being in cases of colporrhaphy followed by one or more subsequent deliveries at term. Two were genuine recurrences, one was urinary incontinence, and one was a cervical hypertrophy. The conclusions drawn from the series were that colporrhaphy is unreliable, especially in elderly patients with atrophic pelvic fascia, but is the best type of operation in younger patients whose tissues are good. Interposition is excellent, but only in selected cases. Vaginal hysterectomy should be done in very bad cases, especially where the uterus is diseased.

Dr. GIBBON FITZGIBBON said he was glad that the President laid emphasis on the place of vaginal hysterectomy in cases of genital prolapse. A cause of confusion was the association of cystocele, rectocele, and prolapse all under the term "prolapse." The three were individual entities and needed definition. It was in cases of high rectocele that removal of the uterus enabled the uterosacral ligaments to be reached and incorporated with the lateral ligament in the restoration of the pelvic fascia to close the hernial

opening. The cure in these cases by operative treatment really depended on what part of the fascia was damaged, and the repair of that part of it. He did not believe in the necessity for the interposition operation. Where there was dropping of the cervix and cystocele, it was in his opinion never successful.

Dr. A. H. DAVIDSON said that since seeing the Manchester operation carried out in Liverpool he had done most of his prolapse work by this technique and found it gave good results. He had supposed that abdominal operations for prolapse had disappeared, but in London recently he had seen ventral fixation done for prolapse of the uterus. He was not very favourably disposed towards the operation of interposition, but thought it had a place—though an extremely limited one—in cystocele. He did not believe that vaginal hysterectomy was a cure for prolapse. It seemed to him important to stress the ætiology of prolapse: it was usually due to extremely bad midwifery.

Dr. T. M. HEALY agreed that the interposition operation cured cystocele. The difficulty was that the patient had no guarantee that she would not afterwards get a descent of her cervix, and the cure of this condition was extremely difficult. Vaginal hysterectomy was not a cure for prolapse unless the supports of the uterus were used to keep up the bladder, and the number of cases in which vaginal hysterectomy was necessary to cure prolapse of the bladder were relatively few. If anything was wrong with the uterus it should be removed, otherwise removal was unnecessary if the Manchester operation had been properly learned and if the technique was carefully carried out. Abdominal fixation of the uterus was good in elderly women with prolapse of the vagina, and a small uterus, when short anaesthesia was desirable.

Dr. O'DONEL BROWNE thought there was no doubt that anterior colporrhaphy and perineorrhaphy would cure cystocele and rectocele with one exception—high rectocele. Most of the cases in which good results were obtained by shortening the ligaments were cured by fibrosis. Prolapse of the rectal canal could be cured by injections of absolute alcohol.—Dr. A. W. SPAIN said he got very good results from the Manchester operation; any trouble he had was in the posterior wall. He thought that patients should be kept in bed for three weeks beforehand and given hot vaginal douches. He would never remove the uterus unless it was absolutely necessary to do so, and if a woman in the child-bearing age could be kept comfortable by the insertion of a pessary this ought to be done.—Dr. BOUCHIER HAYES believed that the whole question was really one of pelvic fascia and fibrosis.

Dr. R. M. CORBET said it was possible to have a cystocele without any prolapse, and it seemed to him unnecessary to push up the bladder and shorten the ligaments unless those ligaments appeared to be lengthened. He was rather in favour of vaginal hysterectomy for the larger type of prolapse; he agreed with Dr. Healy that it was not the hysterectomy but the bringing together of the ligaments that did good. He would advise spending more time in the preoperative treatment of these cases. Operation for high rectocele should if possible be postponed until the child-bearing period was over.

Dr. BETHEL SOLOMONS said that the Manchester operation suggested the conclusion that the main thing in dealing with prolapse was to shorten the tissues about the cervix and to repair the hernias, from which he had evolved his present technique—

namely, (1) a high amputation of the cervix with shortening of the uterosacral ligaments; (2) approximation of the bladder pillars with an extensive anterior colporrhaphy and colpoperineorrhaphy. The results had been good in his own hands and in the hands of some of his assistants. Le Fort's operation was excellent for the old patient, but he did not believe that any abdominal operation was necessary, and unless the uterus was diseased hysterectomy should never be done.

The PRESIDENT, in replying, said he was not an advocate of drastic surgery in prolapse cases, and was not enthusiastic about vaginal hysterectomy or interposition. The important thing for keeping the organs in place was the fascia. He had at one time done interposition; then he had got enthusiastic about the Manchester operation and had done it; but now he had gone back to interposition. If the uterus was too big he did some other operation, and if it was too small he never did an interposition. He did not think the operation suitable in cases of proclitica. Vaginal hysterectomy alone did not cure prolapse, and he regarded ventral fixation as a bad operation for prolapse.

MANCHESTER MEDICAL SOCIETY

At a recent meeting of this society Prof. A. D. MACDONALD, opening a discussion on the

Choice of an Anæsthetic

said that the ideal local or general anæsthetic has yet to be discovered. Only the volatile anæsthetics possess the controllability which makes possible the adjustments to varying needs and varying susceptibilities. The action of mixtures of aliphatic compounds is the sum of the actions of its components; there is no evidence of potentiation, such as exists for morphine and other alkaloids followed by anæsthetics. The use of mixtures, such as A.C.E. and Schleich's, in which the volatilities of the components differ widely, is pharmacologically unsound. Premedication with non-volatile drugs is only justifiable in doses well below the average anæsthetic dose; it is possible that some may affect vital centres before they depress ordinary reflexes.

Dr. E. FAULKNER HILL, in all grave risks where time allowed, would invoke the aid of surgeon, physician, and biochemist as well as anæsthetist to estimate the survival power of the patient, and then enhance this power to the utmost by suitable preparation, diet, rest in bed, and appropriate treatment before operation. In the course of time this would lead to a coördinated and unbiased opinion of the merits of the various methods in common use. But the organisation of such a service would seem to call for the appointment of a special officer.

Mr. GARNETT WRIGHT, from a small personal experience of splanchnic anaesthesia, was hopeful that by its use (1) chest complications might be much reduced, (2) palliative gastrectomy for carcinoma might be safely undertaken more frequently, (3) operation for acute hæmorrhage might be rendered safer.

A lively discussion followed.

TIVERTON AND DISTRICT HOSPITAL.—An up-to-date operating theatre, an X ray room with new plant, and an anaesthetising room are being added to this hospital which has been much enlarged during the last few years. The new extensions will cost about £3000.

REVIEWS AND NOTICES OF BOOKS

Milk : Production and Control

By W. CLUNIE HARVEY, M.D., D.P.H., M.R.San.I., and HARRY HILL, M.R.San.I., A.M.I.S.E., M.S.I.A., Medical Officer of Health and Sanitary Inspector respectively, Borough of Southgate. London: H. K. Lewis and Co., Ltd. 1936. Pp. 555. 21s.

THE different aspects of milk are so numerous and the literature on the subject so vast that it is not really practicable in one volume even so large as this one to cover adequately every aspect of it. Many matters of importance are here ignored, but the authors have succeeded in writing a book of considerable value which covers, particularly on the practical side, all the essentials of milk production and control. It is on the scientific side—i.e., the basis upon which production and control must be founded, if sound methods are to endure—that the volume is inadequate. A saving of space on some of the technical points which are treated in unnecessary detail would have enabled rather more evidence on the scientific side to have been incorporated, giving the book a better balance.

As a practical handbook it can be praised with but few reservations. While critical enough in some directions, as for example on the subject of designated milks, the authors seem to be somewhat timid in exposing the essential defects in our present legislation. This diffidence is associated with a curious attitude to some recent studies upon milk. For example, when discussing designated milk and the classification of milk the authors do not refer to the important report of the Committee on Cattle Diseases issued by the Economic Advisory Council in 1934. That committee after the most exhaustive study and examination of expert witnesses agreed on a complete policy and made explicit suggestions as to the different standards for milk. The chapter on the Future of the Milk Industry might have been much more valuable if this report had been discussed. The impression left by the account of the Tuberculosis Order and Ostertag's method for reducing bovine tuberculosis is that these methods are capable of yielding good results if improved, whereas in fact they are now recognised to be unsound. The reason for the fact that Ostertag's method is not favoured outside Germany is that it has had no effect in reducing bovine tuberculosis.

As a practical guide to clean and safe milk production, however, this book will be extremely useful. Everywhere there is evidence of the authors' familiarity with this side of their subject. The chapter on the cowshed is particularly good, although many authorities will disagree with the contention that the value in double sheds of positions of head-to-head as against tail-to-tail is equally balanced. The dairy, clean milk production, and the distribution of milk are well discussed; a long chapter deals in great detail with the treatment of milk by heat, and not very well-known processes such as stassanisation and pasteurisation in the bottle are explained. The important matter of the control of pasteurisation plants by the inspector is fully described, but the possible defects of such plant and the ways to detect them are not detailed, while some essential points are omitted. Existing legislation is conveniently set out, as are also the essentials of laboratory and other control. The section on chemical analysis seems out of place, for analysts would hardly refer to it and its omission would have enabled some of the

bacteriological laboratory problems to be discussed in more detail. The important phosphatase test is not even mentioned. Other chapters deal with the composition of milk, milk and disease, and the cow.

The monograph will certainly be found useful by medical officers of health and sanitary inspectors, while those concerned on the commercial side will find much instructive matter in its pages. The book is clearly printed and written in an attractive manner; the views expressed will be accepted by authorities as sound in the main, while there are many valuable illustrations. The bibliography is rather a poor affair.

Optical Rotatory Power

By T. MARTIN LOWRY, C.B.E., M.A., D.Sc., F.R.S., Professor of Physical Chemistry in the University of Cambridge. London: Longmans, Green and Co., Ltd. 1935. Pp. 483. 30s.

THIS book is a record of work and progress in polarimetry extending over a period of 120 years, from the original discovery of the optical rotatory power of quartz to the recent theoretical work of Max Born in Cambridge. It is a complete exposition of the subject by one who not only knows all its complexities, but has himself contributed much of the original work described. The first part of the book is mainly historical, but contains an interesting general account of the principles of rotatory polarisation. A reader with little knowledge of the subject will be able to appreciate and understand its elements. The work of Pasteur forms the basis of this section and reminds us that a man to whom medicine is greatly indebted has also contributed largely to an almost unrelated branch of science. The second part deals with the practice of polarimetry, of which the applications are almost unlimited. The measurement of rotatory dispersion in both the ultra-violet and infra-red portions of the spectrum is clearly dealt with and a description is provided not readily available elsewhere. The book concludes with a theoretical account of the subject, which of necessity assumes an adequate knowledge of mathematics in the reader.

Prof. Lowry has produced a book on a difficult subject that is admirable both in intention and execution.

The Microscopic Anatomy of Vertebrates

By G. G. SCOTT, Ph.D., Professor of Biology, City College, New York City; and J. I. KENDALL, Ph.D., Instructor in Biology in the College. London: Henry Kimpton. 1935. Pp. 306. 17s. 6d.

HUMAN anatomy is made both more intelligible and more interesting if taught from a comparative standpoint. The same could be said of histology, though in this case the comparative method has seldom been applied. The chapters of this book deal separately with the microscopic structure of the main vertebrate organs. In spite of the authors' implication to the contrary in their preface, the emphasis is placed entirely upon mammals. The brief account of the particular organ as found in the lower vertebrates, which in some places precedes a description of the mammalian structure, is seldom full enough to afford a valuable comparison. Neither the evolutionary nor the functional significance

of the changes in microscopic structure is emphasised. In several instances, a notable example being the pineal body which has a particularly interesting evolutionary history, no mention whatever is made of the structure as found in the lower vertebrates. There is little value in descriptions of a variety of types unless relationships are discussed. This book will certainly provide a useful introduction to mammalian histology, but the authors have not succeeded in presenting the subject in a truly comparative manner.

A Companion to Manuals of Practical Anatomy

Fourth edition. By E. B. JAMIESON, M.D., Senior Demonstrator and Lecturer on Anatomy, University of Edinburgh. London: Humphrey Milford, Oxford University Press. 1935. Pp. 661. 12s. 6d.

HERE, packed into small space, is a mass of detailed and highly accurate information. The section on the central nervous system is worthy of special mention. The adoption of the English terminology (Birmingham revision) has doubtless contributed to the success of this little book which is as useful a pocket manual as anyone could wish for.

Minor Medical Mysteries

By LEONARD WILLIAMS, M.D. Glasg. Foreword by Lord HORDER. London: Cassell and Co., Ltd. 1935. Pp. 211. 5s.

Dr. Leonard Williams is well known as an accurate clinical observer, possessing clear-cut and often individual views, and as a pungent writer. These qualities appear in his latest collection of essays in which, however, he hardly does himself justice. The reason for this may be that many of the essays were communicated to magazines where space has to be dictated by the editor to the disadvantage of the contributor. It is clear that when 30 medical or semi-medical subjects, all of a sort that invite discussion, are dealt with in 200 small pages, the author cannot develop his theme, and this will be a matter of regret to Dr. Williams's readers, because of the challenging nature of many of his statements and conclusions which are put down with wit and wisdom. Lord Horder's foreword is a just encomium.

Fifty Years a Surgeon

By ROBERT T. MORRIS, M.D. London: Geoffrey Bles. 1935. Pp. 276. 10s. 6d.

THERE have been many books published composed of personal reminiscences centring round the developments of medicine in the nineteenth century, but Dr. Morris's addition to their number has a claim to attention. It is well and brightly written, and the picture supplied of surgical advance in the United States is dramatic. We have a picture of a great American medical school in the 'eighties, and the revolution caused in the Bellevue Hospital, New York, by the introduction of antiseptics. The great advances in technique now made possible are set out, while the perfecting of the methods of administering anaesthesia are shown to have enormously extended the range of the surgeon's utility. There is nothing new in these chapters to the medical reader, but the general public should be edified by their contents. The personal record of private and special practice

is written with zest and leads to a chapter entitled "the fourth era in surgery," by which Dr. Morris means the appreciation in surgical treatment of the influence of the patient's own physiology. This is probably the section whose writing determined Dr. Morris on publication. It is an able but partisan denouncement of surgical interference where the chances of recovery without operative aid have been underestimated. And we learn with no surprise that some of the author's colleagues have not been in agreement with his views.

The book ends with chapters on such much-discussed topics as osteopathy and therapeutic fads, psycho-analysis, birth control, and certain forms of professional delinquency, where the opportunity for telling stories is happily made use of.

Diseases of the Liver, Gall-Bladder, Ducts and Pancreas

Their Diagnosis and Treatment. By SAMUEL WEISS, M.D., F.A.C.P., Clinical Professor of Gastroenterology, New York Polyclinic Medical School and Hospital. With a chapter on Surgery by J. PRESCOTT GRANT, M.D., F.A.C.S., M.R.C.S., Professor of Surgery, and a chapter on Roentgenology by A. JUDSON QUIMBY, M.D., F.A.C.R., Professor of Roentgenology at the same school. New York: Paul B. Hoeber, Inc. 1935. Pp. 1099. \$10.

Prof. Weiss has written this book at the request of his colleagues and students, and offers it as "primarily a practical one" to the medical student, the general practitioner, and "even the specialist." It is in the form of a large and fairly comprehensive systematic treatise. Historical, anatomical, and physiological aspects of the subject are briefly dealt with at the beginning. Descriptions of morbid anatomy appear in their proper places, but over-stressing of pathology is deliberately avoided. Clinical descriptions of disease, methods of examination—including large numbers of laboratory methods—and treatment occupy most of the book. It is profusely illustrated with drawings, photographs, and radiograms, all beautifully reproduced. Paper and print are beyond cavil; our only criticism of the production is that the book is uncomfortably large and heavy. Some of its bulk might easily have been reduced, since the white margin round every page is so excessively broad that its area exceeds that of the printed part.

The text is curiously unsatisfactory. Its English style, when due allowance has been made for recognised Americanisms, often lacks the precision that should characterise a scholarly work; the clay- or putty-coloured stool of obstructive jaundice, for example, is repeatedly described as "discolored." Where the author is noting his own observations, or clinical conditions familiar to him, he is naturally happier, but much of his material is drawn from the literature, and interjected in the form of short paragraphs; critical appraisal of these contributions and synthesis of them into a coherent picture is often wanting, and at times indeed an entirely wrong impression emerges. Thus under the heading "pancreatic diabetes" a two-page account of diabetes is included for the sake of completeness, and it opens with the sentence, "The causes of diabetes are the causes of obesity, the two conditions being constant companions"; this is surely an overstatement even of Joslin's view. In "bronzed diabetes hæmochromatosis" it is said that the skin and organs are red-brown—in most cases the skin is actually leaden-

grey—and that in the final stage of the disease diffuse carcinoma of the spleen is common. Even where the author draws directly on his own experience he is often disconnected and unconvincing, as where he describes a case of thyrotoxic auricular fibrillation with congestive heart failure and hepatic enlargement to illustrate the connexion between gall-bladder disease and cardiac pain. This sort of muddled presentation is so pronounced in the chapter on cirrhosis of the liver that it must reflect a confusion, and therefore an inaccuracy, of thought. A broad classification into “Laennec’s cirrhosis (atrophic, portal, multilobular)” and “Hanot’s cirrhosis (hypertrophic, biliary, monolobular)” is first adopted. The author then describes a number of varieties of cirrhosis, whose relation one to another is by no means clear, and the reader, among other uncertainties, has no means of telling whether the two separate descriptions, of “simple hypertrophic cirrhosis (Hanot-Gilbert)” on pp. 417–420, and of “biliary cirrhosis (Hanot’s syndrome)” on pp. 430–438, refer to the same disease or not.

The book as a whole contains a great deal of valuable material, but it seems to have been put together by a hurried compiler rather than built by a careful architect, and on that account it does not fully justify either the beauty of its production or the labour that has gone to its preparation.

Streamline for Health

By PHILIP B. HAWK, Founder of Food Research Laboratories, Inc. New York and London: Harper and Brothers. 1935. Pp. 186. 10s. 6d.

Dr. P. B. Hawk will be remembered as one of the collaborators with Refuss in certain fundamental physiological inquiries which were published in the American medical literature soon after the war. His system for safe weight reduction consists chiefly in a low calorie diet based on cow’s milk, orange juice, and lettuce, and of periods of repeated fasting, or semi-fasting, with restricted diet in between them. Some would call the style of this book racy, others would say that it was full of frank Americanisms. In any case the language is such as to make little appeal to the majority of English readers. This is the more regrettable because it is essentially one of the sounder books on weight reduction recently published. Readers who can struggle through chapters with titles such as “Is Science cockeyed? Hay! Hay!” will find accounts of many instructive experiments and apt criticisms of many unscientific methods of “reduction.”

Russell A. Hibbs

Pioneer in Orthopædic Surgery, 1869–1932. By GEORGE M. GOODWIN. London: Humphrey Milford, Oxford University Press. 1935. Pp. 136. 10s.

Dr. Goodwin has written an instructive book about an interesting man. The story of Hibbs’s life is worth more attention than many of the medical biographies which reach the public to-day, for the reasons which led to his success call for record alike as a surgical innovator and a hospital administrator. Throughout a very busy life he seems never to have departed from the one idea which he set before himself—namely, to be a champion of the cause of the crippled child. All that he did centred round that object. With no private backing or influence, but rather by determination, he obtained a post in

an orthopædic hospital which needed reform and which, when reformed, would call for extension. He became immediately involved in a dispute with a superior officer, and to the disgust of that superior was held by the lay authorities of the hospital to be right. But many prominent members of his specialty resented the victory of the junior man and proved less than helpful to him when his private practice began to grow. The brief biography shows how Hibbs was able to overcome professional opposition and to reach a high position as an orthopædic specialist, although certain of his theories were never universally accepted. What they were, and how he gave practical effect to them, will be gathered from a series of cases, added as appendices, which make informing reading.

Genetics

By H. S. JENNINGS, Henry Walters Professor of Zoology and Director of the Zoological Laboratory in the Johns Hopkins University. London: Faber and Faber Ltd. 1935. Pp. 351. 15s.

MODERN genetics has given rise to more unwarranted and dogmatic generalisations than almost any other branch of science. At every stage in its development the particular facts have seemed to point in an attractive manner to far-reaching general conclusions. Popular books on the subject seldom describe the experimental evidence fully enough to allow the reader to judge for himself of the validity of these conclusions, and this is unfortunate in view of the interest taken by the educated public in the possible application of genetic principles to human affairs. The groundwork of the subject however, as Prof. Jennings points out, “involves detailed facts and relations which must be thoroughly grasped,” and the general reader who wants to be put into a position to form opinions is faced with some hard work.

Prof. Jennings gives a clear account of the chromosomal theory with continual reference to the original work on which the theory has been based. He does not doubt that in a stable environment all inherited characteristics are determined by the genes, which are borne in a linear fashion upon the chromosomes. Beyond this point he suspends judgment, presenting the facts and various different conclusions which might be drawn from them. He shows how the original idea of the fixed action of a gene is being rapidly undermined. There is now some evidence that the action of a gene is dependent upon its position in relation to other genes. Should this prove to be correct “it would require a reinterpretation of many of the accepted ideas of genetics.” The unsatisfactory state of our knowledge about the relative influence of hereditary and environmental factors on human characteristics is emphasised. The book concludes with two interesting chapters on genetic variations, natural and induced by radiations. There can be no doubt that many species have diverged from a common stock to a limited extent as a result of eliminations, reduplications, and translocations of chromosomes. But Prof. Jennings seems to be of the opinion that, whatever kind of variation has formed the basis of progressive evolution, the changes in the action of single genes which have so far been observed and are known as mutations have not necessarily thrown much light upon the problem. This is certainly an unorthodox suggestion, but it must be admitted that the mutation theory of evolution is by no means as firmly established as is often assumed.

THE LANCET

LONDON: SATURDAY, JANUARY 11, 1936

PHYSICAL EDUCATION

THE year 1935 will be a memorable one in the history of physical education in this country. The prominence given to physical fitness by the King's Jubilee Trust Fund has stimulated official and voluntary organisations concerned with gymnastics and games for children and young people to greater energy, while the need for recreative and enjoyable occupation for unemployed men and women in distressed areas has led to the setting up of schemes for physical training which, it is hoped, will be developed and extended to the great benefit of national health and physique. Physical training has been slow to receive adequate recognition in England. It first became a normal and regular part of the elementary school curriculum in 1909. Sir ROBERT MORANT, then secretary of the Board of Education, realised not only its importance to the health of the growing child, but its close association with the school medical service and hygiene. Therefore he entrusted the preparation of a revised syllabus of physical exercises to the medical department of the Board, and placed the newly appointed staff of special inspectors under the general control and guidance of Sir GEORGE NEWMAN. The progress of physical education may be read in the successive reports of the chief medical officer. A new syllabus was called for in 1919, and yet another in 1933; from time to time supplementary matter has been issued dealing with particular problems such as the organisation of games, the work in small country schools, the value of playing fields, and so forth; and there are other books now in preparation which will provide for the needs of the older boys and girls in the senior schools.¹

The general policy of the Board of Education has been to leave physical training in the elementary schools in the hands of the class teachers; to give all teachers some special training, but to encourage them to supplement this by attendance at suitable vacation courses and classes; and to support the appointment by local education authorities of expert organisers whose duties include general supervision of physical training and advice to individual teachers. This policy has been successful, but it is pleasing to note that the Board now appear to be pursuing it with greater energy, and that increased attention is being paid to secondary

education in this subject. Systematic physical training, as apart from games, has been seriously hampered in public and secondary schools for boys by the lack of trained gymnastic masters; even now there is only one training college for men—viz., Carnegie Hall, founded at Leeds a few years ago by a grant from the Carnegie United Kingdom Trust—whereas for 50 years there have been facilities for the training of women. Fortunately the growing demand for teachers and "leaders" is bound to result in more ample opportunities for training, as well as greater scope for employment after qualification. But the authority of the Board is limited to schools and educational work, and there is a strong feeling that much more might and should be done for the promotion of physical activity in its broadest sense, not only among young men and women, but among older persons of both sexes. The "keep fit" movement, for example, which originated in Sunderland and is rapidly spreading over the whole country (see p. 125), is providing healthy physical interests for hundreds of women, many of mature age, who had never experienced the joy of movement before. Gymnastic classes and games are doing the same for young men. The Central Council of Recreative Physical Training, a representative and voluntary organisation established early last year under the patronage of the KING and QUEEN and the presidency of Lord ASTOR, has been formed to coördinate and encourage all types of recreative activity.² The national playing fields association, organisation for the promotion of athletics, swimming, camping, hiking, as well as games, dancing, and gymnastics, are all combining to arouse a much wider appreciation of the value of exercise, open air, and sunshine, and to show that no one need feel too old or too stiff to enjoy some form of exercise.

In this country we have long been proud of our traditional games, though they have been played by the few rather than the many. Our system of gymnastics was borrowed mainly from the Scandinavian countries. But at long last we are beginning to develop a scheme of physical education of our own, which we hope will be characteristically national. We shall take full advantage of the experience and knowledge of other lands, but shall adopt, modify, and add to this so as to meet the needs of our climate, our social and educational conditions, and our national habits and customs. Physical education, wisely used, has an immensely important contribution to make towards a state of positive good health, which is something much better than the mere prevention of disease.

THE CYTOLOGICAL EXAMINATION OF MILK

THE microscopical examination of milk for tubercle bacilli is preferable to the biological test in so far as it is simpler and quicker. Unfortunately these advantages are counterbalanced by

¹ See the report of the C.M.O. of the Board of Education for the year 1934. H.M. Stationery Office. 2s. 6d.

² This council has just issued its first news leaflet, which may be had from the organising secretaries, 11, Doughty-street, London, W.C.1.

the fact that the organisms cannot be seen in milk under the microscope unless present in enormous numbers. According to D. R. WOOD¹ the microscopical test is 500 times less sensitive than the biological; and estimates of the same order have been made by other workers. Such comparisons refer to the classical method of examination which consists in laboriously searching smears of milk deposit under the oil-immersion lens for acid-fast bacilli; and the weary observer derives little comfort from the reflection that the finding of such organisms carries no assurance that they really are tubercle bacilli and not saprophytes. More recently attention has been turned from the direct examination of films for acid-fast organisms to the study of the cells found in milk and their relation to tuberculosis. H. L. TORRANCE² drew attention to the occurrence of certain more or less characteristic groups of cells to be found in tuberculous milk. Other workers have confirmed these findings, and S. T. COWAN and L. MADDOCKS³ now report the results of a careful study of the cytology of 229 samples of milk from single cows. If centrifuge deposit is spread in a thin film and stained the cells are for the most part distributed uniformly over the whole surface; but here and there clumps of cells are encountered. These may be composed of endothelial cells, non-endothelial cells, or of a mixture. COWAN and MADDOCKS found that whilst such cell groups might be present either in tuberculous or non-tuberculous milk, more of them, particularly of the endothelial type, were observable in tuberculous milk. It was also found that in tuberculous samples acid-fast bacilli showed a tendency to collect near the cell groups; bacilli lying far away from these groups were more likely to be non-pathogenic ones. Thus a large surface of a smear may be looked over rapidly under a low magnification, and the areas containing endothelial cell groups can then be subjected to examination for the presence of acid-fast bacilli under a high magnification. The 229 samples examined in this way by COWAN and MADDOCKS were also tested on guinea-pigs. From 38 of them tuberculosis was produced in these animals, in 7 of these cases the degree of contamination being slight if judged by the extent of the lesions produced. By microscopical examination acid-fast bacilli associated with cell groups were found in 21 samples. None of the 7 lightly contaminated samples was detected in this way. In 2 samples acid-fast bacilli were found unrelated to cell groups, and were given a preliminary label of saprophytes, this diagnosis being confirmed later by guinea-pig inoculation. Tubercle bacilli were never found in the complete absence of cell groups and only rarely in association with groups containing no endothelial cells. No positive results were obtained by microscopical examination which were not confirmed by biological test. It emerges that attention to the cytological picture is a most useful preliminary to the microscopical examination of samples of milk

from single cows, for evidence of contamination by the tubercle bacillus increases considerably the proportion of positive results obtained. Even in its improved form, however, this method is not sufficiently sensitive to justify the omission of guinea-pig inoculation, while when bulk milk is being tested it is of very little value.

The cytological study of milk is not confined to the diagnosis of tuberculosis. Attempts have also been made to diagnose other forms of mastitis, in particular the economically important streptococcal form, by this means, but the value of the method is still in dispute. In extreme cases no difficulty arises; milk containing enormous amounts of leucocytic deposit clearly comes from an abnormal udder, whilst a sample which contains no leucocytes has probably come from a healthy udder. In intermediate cases interpretation of findings is more difficult, for it has frequently been noted that in milk from healthy udders the cell count may be high during the late colostrum period and when drying off, though low at other times. It is thus necessary to have a full history of the cow from which the sample comes. Where milk from several cows has been mixed the high cell content of one fraction may be cloaked by dilution with normal milk. A differential cell count is of far greater value than a total count in judging the quality of milk. A high cell count including erythrocytes, monocytes, eosinophils, or pus cells showing phagocytosis suggests inflammatory changes, whereas desquamated epithelial cells, round cells, and neutrophils are less significant. Differential counts are, however, tedious to carry out and require considerable experience, whilst the dilution factor still comes into play.

One of the most serious defects of the cytological examination of milk as a diagnostic measure is that even where inflammatory exudate can be demonstrated, evidence is still lacking as to the cause of the inflammation, except on the comparatively rare occasions when it is possible to demonstrate the causal organism microscopically. Inflammatory exudate may be found in cases of mastitis, due to the tubercle bacillus, the streptococcus, and the staphylococcus as well as in other less important types of mastitis. Of these infections, contamination of milk by *B. tuberculosis* is of course a danger to public health. Streptococcal mastitis is of importance from the point of view of health of the consumer only in so far as such infection may affect the nutritive quality of the milk; but from the economic aspect such infection is of immense importance to agriculture. Staphylococcal mastitis is relatively unimportant economically but may have a public health significance. The significance of the mastitis in short depends on the nature of the causal organism, which for the most part can only be ascertained by resort to other methods. The microscopical examination of milk may sometimes prove a useful and a rapid aid to diagnosis, particularly in tuberculous and occasionally in other types of mastitis, but such an examination is not an adequate substitute for cultural or biological tests.

¹ The Analyst, 1931, lvi., 179.

² Veterinary Rec., 1922, ii., 289, and 1927, vii., 875.

³ Jour. Path. and Bact., 1935, xli., 373.

HISTIDINE TREATMENT OF PEPTIC ULCER

THE multiplicity of the methods of treatment devised for peptic ulcer emphasises alike the incompleteness of our knowledge and the need for caution. The chronicity of the disease, and its tendency towards relapse and remission, make it an awkward subject for therapeutic investigation, and we are also handicapped by the difficulty of reproducing in animals the typical chronic ulcer found in man. Among the more interesting of the remedies now on trial is the amino-acid histidine, given by injection. The work on which its use is based begins with observations of MANN and WILLIAMSON in 1919, when they found that if the duodenal secretions of dogs are diverted into the lower end of the ileum the animals soon develop peptic ulcers like those of human beings, and severe nutritional disturbance leading to death in a few weeks. ARON of Strasbourg, repeating these experiments (with WEISS) in 1933, reported¹ that of five animals thus operated on two died with ulcers whereas the other three, which had received histidine and tryptophane injections, showed no ulceration at all. These injections were given in the belief that the development of ulcers in the dogs was in some way due to amino-acid deficiency resulting from the surgical interference with protein digestion. Further work led ARON to apply his theory to the treatment of peptic ulcer in man, and using intramuscular injections of a 4 per cent. solution of histidine hydrochloride—prepared by Messrs. Hoffmann-La Roche under the name of Larostidin—he reported very good results in 17 cases. Since this first paper by ARON and WEISS appeared in 1933 some eighty other records of the use of larostidin have been published in America, Germany, Italy, and other countries. The new form of treatment has been adopted with unusual readiness because its advocates have claimed from the first that it largely, if not wholly, takes the place of diet, alkalis, and rest in bed. Such claims demand even more careful study than those made for remedies which are merely ancillary to the better established therapeutic measures.

It will be generally admitted that, whatever the treatment, medical or surgical, the ultimate prognosis as regards cure of peptic ulcer is at present none too good. Statistics of permanent cure vary between 50 and 90 per cent., but if a long enough margin is allowed—it cannot be less than five years and should properly be much more—the final percentage is probably not above 75, and less for duodenal lesions. On the other hand, almost all forms of treatment seem capable of producing temporary improvement in almost every uncomplicated ulcer. Simple dieting may bring immediate relief; moderate or massive alkali treatment, duodenal feeding, and sometimes merely rest and freedom from worry, will often do the same. For many years, since HOLLER first recommended injections of protein in 1921, various forms of parenteral therapy have been recommended and

widely used in support of dietetic or other régimes. Among them, vegetable proteins, milk, vaccines, emetine, pepsin, and many others have been given favourable reports. Indeed, it seems that non-specific protein therapy may be expected to hasten healing and lower gastric acidity, and these are grounds for using it. Histidine treatment differs from the others because it is based upon the view that peptic ulcer is at least partly a deficiency disease, and that injection of this amino-acid will correct part of the deficiency. It does not appear probable, however, that the diet of the patient, who afterwards gets an ulcer, is consistently deficient in protein—in fact many are normally big meat-eaters—and if such deficiency arises through faulty digestion or absorption of proteins no cause for the failure is yet known. The effects of drastic interference with the digestive secretions of dogs cannot be applied to man without reserve, and the rationale of histidine treatment requires further support. Judgment of its value must therefore be formed largely on clinical experience.

The dose recommended is 5 c.cm. of a 4% solution histidine hydrochloride given daily by intramuscular injection for a period up to three or four weeks and repeated as required. There are said to be no dangers, the patients need not be kept on a restricted diet, alkalis are unnecessary, and rest in bed is usually not required. Relief from symptoms follows as a rule in two to six days, and some 60–90 per cent. of cures are recorded. But as most workers point out—for example, BULMER² and SMITH³ in this country and RAFSKY,⁴ EADS,⁵ BOGENDÖRFER,⁶ and WEISS⁷ abroad—it is far too early to assess the value of this treatment. Already some disappointing relapses are known and there will probably be general agreement with IZAR⁸ that histidine is not a specific remedy for peptic ulcer, in the sense that it does not counteract the cause. If this is so, it must seem unwise to relax attention to dietetic and general measures while carrying out injection treatment. The longest case-histories hitherto reported are less than two years, and the word "cure" is therefore inappropriate to any of them. At the same time the many accounts of relief of symptoms, increase in weight and well-being, and removal of clinical and radiographic evidence of active ulceration point to the treatment being in some way beneficial. Whether its action will turn out to be in any sense specific or is merely (as seems likely) comparable to that of other injected substances, and whether it can lead to lasting cure or replace other therapeutic measures, are questions that can be decided only by further study. The time has not yet come for accepting an entirely new theory of ulcer-causation, and for abandoning the ordinary rules of diet and management.

¹ Bulmer, E.: THE LANCET, 1934, ii., 1276.

² Smith, D.: Brit. Med. Jour., 1935, ii., 154.

³ Rafsky, H. A.: Med. Rec., Sept. 18th, 1935, p. 289.

⁴ Eads, J. T.: Amer. Jour. Digest. Dis. and Nutrit., 1935, ii., 426.

⁵ Bogendorfer: Münch. med. Woch., 1934, lxxxix., 1270.

⁶ Weiss: Schweiz. Rundschau, f. Med., 1934, No 21.

⁷ Izar, G.: Policlinico, 1935, l., 2447.

⁸ Aron, E.: Recherches sur l'ulcère expérimental, Thèse de Strasbourg, 1933.

THE BAR ON THE CORONER

THE General Council of the Bar would insist upon the necessity of a legal training for coroners. It also protests against the action of certain important local authorities in stipulating that the coroners whom they appoint must have a dual qualification in law and medicine. So much we learn from the annual statement of the Bar Council wherein is reported a summary of the barristers' official representations to the Home Office Committee now inquiring into the law and practice relating to coroners. The Bar does not want to see inquests abolished, but it wants them brought into line with other courts. Its demand for recognition of the right of barristers and solicitors to examine and cross-examine witnesses before coroners was inevitable. In practice this right is conceded already save in extreme cases where legal representatives get at loggerheads with their tribunal. Another by no means revolutionary recommendation is the demand that committal for trial upon coroners' inquisitions be abolished. Such committals have been greatly diminished by the 1926 Act, and they are sometimes made to look a little forlorn at the resultant prosecution. The solemn extravagance and anticlimax of Lord DE CLIFFORD'S trial in the House of Lords last December might never have been staged but for a coroner's committal. It is a question of expediency whether the rare occasions when these committals catch a criminal who would otherwise escape are sufficient justification; there are, of course, plenty of committals from other courts than the coroner's which prove abortive.

The Bar Council's demand for adherence to the strict rules of evidence is a more awkward business. A great part of the coroner's usefulness to the community is his power of sifting local gossip in

cases of suspected crime. In almost every court of law some bit of technically inadmissible evidence sometimes slips in and is consciously disregarded. There seems no reason why a coroner should not be trusted to distinguish between good and bad evidence. When the police make preliminary inquiries, they are glad enough to listen to hearsay, and it may well be that those responsible for bringing our criminals to justice will successfully object to the Bar Council's proposal. The mysteries of the strict rules of evidence—one of the causes why it is popularly believed that the truth does not always emerge in a court of law—are based on the fact that certain parties are admitted to the legal proceedings and certain issues have been carefully defined beforehand as the case which the court is to try. It is not going to be a simple matter to practise these mysteries at an inquest where it is often the coroner's task to find out what parties may be concerned and what issues may be expected to arise. Naturally the more complicated the procedure the greater the need for legal coroners and legal intervention at inquests. But if the inquest is to be converted into something like an inquiry before a stipendiary magistrate, it will cease to be the institution which has proved its usefulness by surviving through so many centuries.

Which are the better coroners, doctors or solicitors? It is doubtful whether persons who are in a position to decide the question would venture any sweeping generalisation in reply. The public, at any rate, probably detects little difference between a solicitor-coroner with a knowledge of medicine and a doctor-coroner with a knowledge of law. Best of all is the coroner who is duly qualified in both law and medicine. Yet it is this dual qualification which the Bar Council cannot abide. There is, it seems, nothing like leather.

ANNOTATIONS

PSYCHOGENIC FACTORS IN ASTHMA

Two papers in the *Guy's Hospital Reports* describe an important advance in the understanding of the asthma-eczema-prurigo syndrome. The work on which they are based was stimulated by the experience—already mentioned in reports to the Asthma Research Council¹—that in intractable cases children sent to a convalescent home show immediate improvement and remain in good health until they return to their own homes, when they relapse at an equally striking rate. The first paper² shows the factors concerned in this phenomenon and tells how clinical results proved that the psychological environment of child patients is as important as the physical. Moreover, one kind of personality is predominant among this group of cases. It is noted that, for example, in a group of enuretic children one finds almost any type of personality, whereas child sufferers from the asthma-eczema-prurigo syndrome present with unusual frequency a combination of high intelligence, ready manifestation of anxiety and insecurity, and strong tendencies towards aggressiveness and egocentricity.

On the parental side is found with similar frequency a nervous, over-anxious protective attitude that is plainly the cause of a part of the child's emotional state. Psychotherapy directed in accordance with these observations has been sufficiently successful for the writers to suggest that it has at least as much to offer as any other available kind of treatment for this type of asthma patient.

These results are gratifying, and the way in which the theoretical aspect of the subject is handled marks a forward step in methodology which raises the work well above the level of another addition to the numberless "cures" of asthma. The emotional determination of the asthma attack is no new discovery, but for some workers the mind-body antithesis has so great a hold that the demonstration of allergic phenomena excludes any need for psychological examination of a patient or, conversely, the curative effect of psychotherapy settles the problem of causation. Dr. Strauss³ claims as established the point that one cannot correctly talk about "true asthma" and "psychogenic asthma," and sets out as the object of research the evaluation of the degree in which the psyche participates in the asthmas in

¹ See THE LANCET, 1934, II., 1171.

² Rogerson, C. H., Hardeastle, D. H., and Duguid, K.: *Guy's Hosp. Rep.*, 1935, LXXXV., 289.

³ Strauss, E. B.: *Ibid.*, p. 309.

general. References to his own experience show that asthma can be—or behave as—a symptom of conversion hysteria or an anxiety equivalent, but such cases are only on the surface of the problem. Dr. Rogerson² indicates its more profound difficulties when he notes the impossibility of separating the intellectual and temperamental endowment of the individual from his physical endowment, to disregard the one and call the other constitution. Apparent contradictions that have hitherto been used as arguments in controversy present themselves no longer as contradictions but as problems needing an answer. The appearance of allergic reactions in an infant of six months, for example, calls for an explanation of the curious clinical picture—a disabling physical illness from infancy which appears to respond to a modification of the psychic milieu.

This work, original as it is, does not stand alone. We have commented upon the results of the psychological examination of gastric ulcer patients by Draper and Touraine,⁴ who found throughout that group peculiarities which marked them, like these asthma subjects, as possessing a specific personality picture. Similar results have been claimed in the examination of migrainous subjects, and apart from possible therapeutic applications, all these observations point to some underlying general principle the discovery of which may perhaps give a new direction to the study of physiological processes as influenced by that indefinite something that we call the psyche.

"CHRONIC CYSTIC MASTITIS"

DESPITE repeated efforts on the part of various writers to clarify the subject, by changes in nomenclature and by fresh conceptions of the underlying pathology, there still exists much confusion about that condition of the breast which used at one time to be labelled and dismissed without more ado as "chronic cystic mastitis." Two conflicting views now held by different schools of thought have never been adequately balanced—one that the disease is characterised by such an aberrant type of epithelial activity as to make carcinomatous change a dangerous possibility in every case; the other, that chronic cystic mastitis is essentially an exaggeration of a normal physiological change, and that malignancy, when it does complicate the simple disease, is as fortuitous as it is in the "normal" breast. The former view is upheld vigorously by Cheate and Cutler⁵; the opposite opinion, at least as regards the likelihood of malignant change in the affected breast, was re-stated only recently in our columns as the experience of Mr. Eric Pearce Gould.⁶ The outcome of this disagreement is that when a surgeon meets with the common type of "lumpy" breast, he is embarrassed by the knowledge that whatever line of treatment he may advise is open to serious criticism. Dr. Percy Klingenstein⁷ in a recent paper draws comfort from a statement of Bloodgood's that cases of doubtful malignancy treated by radical operation have done well. Klingenstein himself does not advise such drastic measures. He quotes figures to show that conservative surgery has a definite place in the treatment of "chronic mastitis." Where some may be inclined to join issue with him is in his recognition, with Cheate, of "mazoplasia" as a physiological state, as distinct from cysts and intracystic and intraductal papillomata, which he regards as of true neoplastic forma-

tion. J. S. Rodman⁸ is much impressed with the extent of epithelial development and involution characteristic of the menstrual cycle. There does not seem to be any sound proof that the glandular menstrual changes in the breast are as profound as he believes. E. K. Dawson's⁹ observations on normal breast tissue have, in fact, led her to an opposite conclusion. While the gaps in our knowledge of normal breast histology and physiology are still so wide, it is a matter of difficulty to interpret the more generalised states of epithelial change, particularly, perhaps, in patients before the menopause.

The observations of Mr. Harold Burrows¹⁰ are suggestive. He found that in their response to oestrogenic substances, the breasts of some of his mice showed more pronounced hyperplasia and less marked cystic dilatation, while in others a pronounced dilatation was accompanied by relatively little hyperplasia, that, in fact, the two conditions seemed to occur in inverse ratio. As far as these experimental results go, they suggest that cyst formation in itself, though pathological, may be found actually to carry a more favourable prognosis than hyperplasia of the epithelium, for Burrows has found the latter condition to result from a more prolonged administration of oestrin, and to be a later effect than is cystic dilatation. It seems likely that the *localised* lesions of the breast, such as adenomata (whether of the fibro-adenoma, or the adeno-fibroma type); blue-domed cysts; papillomata; and intracanalicular fibromata, are in pathogenesis more similar to "chronic cystic mastitis" than was at one time generally thought. Encapsulation of these tumours may be very imperfect, as is well known to the surgeon who attempts their removal under local anaesthesia. A more or less generalised change in the surrounding breast tissue is not infrequent. In sections right through a breast which is the site of "chronic cystic mastitis" all the above changes—papillomata, fibrosis, cysts, and adenomata—may be found in miniature, as it were. This consideration complicates the treatment of tumours clinically localised. Rodman regards all these changes as aberrations due to interference with the proper growth and involution characteristic of the sexual cycles.

When we attempt to come to conclusions about the prognosis and treatment of this condition, we meet the further difficulty that the criteria are missing on which, in individual cases, the transition from simple to malignant hyperplasia may be decided. Also—and it should be possible in time to fill this gap in our knowledge—there is a great paucity in the literature of follow-up results of cases treated by the more conservative measures. What we want to know is whether these patients return later with cancer. Klingenstein followed 54 patients who had been treated by partial breast excision, and found that, with two exceptions, they remained free of malignancy for periods of 2–11 years. The two exceptions developed cancer of the breast, one seven years and the other one year after operation. Klingenstein quotes a report of Greenough and Simmons on 83 cases of cystic mastitis, treated by local operation, in 4.8 per cent. of which cancer later developed. Rodman follows Cheate in accepting the incidence as being 15–20 per cent. in patients over 35. He advises watching patients over this

¹ See THE LANCET, 1934, ii., 661.

² Tumours of the Breast, London, 1931.

³ THE LANCET, 1935, ii., 899.

⁴ Ann. Surg., 1935, cl., 1144.

⁵ Amer. Jour. Surg., 1935, xxvii., 452.

⁶ Edin. Med. Jour., 1934, xli., 653.

⁷ Brit. Jour. Surg., July, 1935, p. 191.

age for two months. If a lump in the breast, which has been diagnosed as benign, does not in this time show evidence of disappearance, he advocates simple amputation. In patients under 35, he would watch for changes in the swelling before, during, and after the menstrual period; if there is no change he would amputate. The significance of a serohæmorrhagic discharge in these cases is considered by Klingenstein. He regards it as indicating the advent of intracystic or intraductal epithelial proliferation. Few surgeons would take the risk of not removing the breast in a case of mastitis complicated by a serous or serohæmorrhagic discharge, spontaneous or induced by gentle massage in the direction of the nipple. The great importance of sending every breast removed for pathological examination, if it were not otherwise recognised as a wise precaution, would be proved by the difficulty in recognising diffuse intraduct carcinoma. The macroscopic similarity between this admittedly rather rare condition and "cystic mastitis" has been sufficiently demonstrated.

THE BIRTH CONTROL MOVEMENT

THE National Birth Control Association, with which the Birth Control Investigation Committee is incorporated, has published this week its fifth annual report, and a history of five years of work offers to the governing body a good opportunity to summarise the past, review the present, and indicate plans for the future. When this Association started in 1930 the Ministry of Health had issued no memoranda defining the powers of local authorities in the matter of giving birth control instruction, and no local authorities had opened clinics although there were 16 voluntary bodies of this description. The staff consisted of the secretary and there were no local branches. To-day the Association has 28 local branches and the staff consists of seven, including three organisers—by no means an extravagant staff considering the amount of ground that is covered. The Ministry of Health has issued 3 memoranda, 66 municipal and 47 voluntary clinics have been established, 42 local authorities send patients to private doctors or clinics, 56 have passed favourable resolutions, while 14 have expressed themselves willing to lend or hire premises to local branches for voluntary clinics. The total expenditure, apart from research, has come to just over £6000 for five years' work.

The present situation indicates that the next five years should show an increasingly rapid development. In 1934 the circular issued by the Ministry of Health elucidated previous provisions and made it clear that the maternity and child welfare authority has the power to give advice at a gynæcological clinic to all women in need of medical counsel. The 56 local authorities mentioned above as having shown a favourable attitude towards the work must be induced to implement their goodwill; but there still remain over 250 child welfare authorities in England and Wales which have taken no action of any sort. The Association possesses evidence that organising work produces quick results, the words of the report being:

"In many a town, an organiser who on her first visit was greeted with suspicion and apprehension so that many of those upon whom she called were afraid to discuss birth control, has at the end of a few months established a branch with a strong committee, influential supporters, and a flourishing clinic."

The public attitude to the work is shown by quotations from the reports of medical officers of health

and from borough councils, one from a Welsh urban district council stating that a comparison with last year's statistics shows that the number of women attending on account of debility, due to too frequent child-bearing, has increased from 18 to 26 per cent. There is also an increase in the number of patients suffering from debility due to miscarriage or abortion.

From the investigation committee, of which Sir Humphry Rolleston is chairman and Dr. C. P. Blacker the honorary secretary, and from the medical subcommittee, of which Dr. Helena Wright is chairman, come also evidence of progress, and, as might be expected, the increased activities call for, while they justify, an increased income. The need, as stated, is remarkably modest; the Association wants, in order to pay its way and meet expansion, at least £1800 per annum, but possesses an income of £1000 only. Its call for further support is amply justified, and the latest record of work done should lead to the necessary increase of members. Subscriptions and donations should be sent to the hon. treasurer, National Birth Control Association, 26, Eccleston-street, London, S.W. 1. The annual subscription of members is £1 1s.

A BIOLOGICAL ASSAY OF LIVER EXTRACTS

MANY attempts have been made to devise a method for biological assay of liver preparations. None has hitherto proved of practical use. It has hitherto been essential to test all material of unknown potency upon patients with Addisonian pernicious anæmia. Such patients should have a red cell count below 2,000,000 per c.mm., and no complicating factors such as sepsis present. Recently however, two promising lines of attack on the problem have been proposed. Miller and Rhoads¹ by feeding swine with a modified form of the diet which produces black tongue in dogs have produced a symptom-complex, not unlike that of pernicious anæmia, which is relieved by the administration of potent liver extracts. These observations suggest that in the future such anæmic swine may be used as test animals. Landsberg and Thompson² and Jacobson³ working independently have shown that the guinea-pig reacts to the administration of potent liver preparations by a reticulocytosis. Jacobson employed adult male pigs weighing between 300-800 g. and kept on a diet of oats, carrots, and lettuce. He found that 30-70 per cent. of the animals showed a significant rise in the number of reticulocytes following parenteral injection of active liver preparations when first given. The uninjected guinea-pigs offer no clue that might seem to differentiate between the two classes of guinea-pigs—i.e., those that will react and those that will not. Further tests of initially non-reactive animals may show them later to have become reactive. Conditions in the guinea-pig necessary for a reaction to occur are not yet clear. Using known reactive animals, it has been possible to show that for every active material there exists a minimal effective dose which is termed the guinea-pig unit of hæmopoietic activity and which is a quantitative expression of the degree of activity. It would appear justifiable to conclude that the capacity to induce a reticulocytosis is confined to materials effective in pernicious anæmia, since, when an assay on guinea-pigs of crude extract from human livers was made, a control healthy human

¹ Miller, D. K., and Rhoads, C. P.: *Jour. Clin. Invest.*, 1935, *xiv.*, 153.

² Landsberg, J. W., and Thompson, M. R.: *Jour. Amer. Pharm. Assoc.*, 1934, *xxiii.*, 964.

³ Jacobson, B. M.: *Jour. Clin. Invest.*, 1935, *xiv.*, 665 and 679.

liver gave a value of 127,000 guinea-pig units, while that of a case of pernicious anæmia in partial remission had a value of 47,000, and that of two cases in relapse had a value of only 650 and 380 guinea-pig units. The material in liver, therefore, which is reticulo-cytogenic in the guinea-pig is at least closely related to the material effective in pernicious anæmia. The administration of the extrinsic factor of Castle alone to guinea-pigs was ineffective, but extrinsic factor predigested with gastric juice was reticulo-cytogenic. Comparative studies of potency of certain materials carried out on guinea-pigs and patients gave results which agreed in a satisfactory manner. The rise in reticulo-cytes considered positive by Jacobson is slight, but from considerable experience he claims that provided a rigorous technique is employed the results obtained are significant and he concludes that regardless of the obscurity of the basis of the phenomenon the guinea-pig test is a valid indicator of the therapeutic efficiency of materials effective in pernicious anæmia.

THE CANADIAN MEDICAL ASSOCIATION¹

THAT the history of medicine is, speaking in general terms, a history of civilisation, is becoming more obvious as more historical reading is placed before us. For numerous books which have been published during the last 20 years tell the story of medical improvements and developments as they are contemporary with the evolution of general politics. The fact that throughout the most troublous times in the story of nations medicine has gone steadily on its way, while dominions and powers disappear or are modified out of their original schemes, contrasts the record of medicine as a continuous one with general history which has been subjected to countless breaks and setbacks. One great example only of this steady progress will suffice—it stares us in the face. The recent European war has seen a complete dissolution of many political systems, while the science of medicine has not only maintained its progress but has benefited in obvious directions by the opportunities given for new work to meet new circumstances. Dr. MacDermot in telling the story of the Canadian Medical Association shows very well that when once the idea of coöperative action has been perceived, the medical spirit will lead to organised action, and that the results of that action will be for the public good, whatever troubles general society as a whole may be going through. The Canadian Medical Association grew from small beginnings and for many years its position was quite precarious. Attempts to organise medicine in Canada were made at least 90 years ago, but for the first 50 years they were abortive, or only useful in affording experience to others who were resolved to carry on the work. At the end of the last century, however, and indeed up to the breaking out of the European war, the Association became representative of the Canadian profession, established a relationship with local and provincial medical societies, and issued a journal which promised to be well established. Then came the war when the systematic work of the Association was sharply curtailed, for its individual members were mostly involved in military duties and a mere skeleton of the organisation remained. It was contrived, however, to keep the journal alive, and three years after the war a strong committee restored the Association to a stable position, so that

to-day, while looking back upon an honourable past a useful future is open to it. Dr. MacDermot supplies an interesting chapter in medical history.

HIGH PROTEIN DIETS IN ALBUMINURIA OF PREGNANCY.

To the devising of diets for the toxæmias of pregnancy there is no end, nor is there likely to be as long as the ætiology of these disorders remains obscure. But while most of the régimes which have been proposed have enjoyed only transient or local vogue, there is a fairly widespread and persistent impression that protein is bad for the potential eclamptic. How this impression has gained credence is not clear, for the idea of eclampsia as a result of rotting of flesh food in an obstructed bowel seems to depend more on vegetarian superstition than on scientific fact. Nevertheless, the superstition dies hard and there is little doubt that protein restriction is widely practised, not only in toxæmia but also in normal pregnancy. There is no convincing evidence that the practice does good, but is it certain that protein restriction is not harmful in pregnancy? After all the full-term uterus and its contents represent a considerable mass of protein which must come either from the mother's diet or from the protein reserves of her own muscles. A recent paper by M. B. Strauss¹ has some bearing on these reflections, for he reports that the protein content of the diet and also the concentration of protein in the blood plasma is consistently lower than normal in cases of pre-eclamptic toxæmia. Moreover, he found that when he treated such patients with diets poor in protein the œdema and albuminuria were aggravated; whereas a high protein diet led to a reduction of the œdema and improvement of the toxæmic symptoms. The significance of these observations is not, as yet, clear, for the improvement in the latter group may have been partly due to simultaneous administration of vitamin B. The number of cases so far treated has also been small and it is well known that simple rest in bed will often cause considerable improvement. It would certainly be unwise to infer that protein starvation is an important cause of toxæmia, for it must be remembered that the incidence of eclampsia was abnormally low in the starving central European countries during the last war. The problem goes deeper than that; but Strauss's paper should at least prompt the obstetrician to ask himself whether he is justified in depriving the pregnant woman of protein.

SYMPATHECTOMY FOR DYSMENORRŒA

THE cause of primary dysmenorrhœa has never been ascertained. On the assumption that it may arise from some disturbance or imbalance of the sympathetic innervation of the uterus, interruption of the sympathetic supply has of recent years been advocated and practised with considerable success. Of the several methods which have been devised that of Cotte (resection of the superior hypogastric plexus) seems to be the most satisfactory. V. S. Counsellor and W. McK. Craig² have reported 14 cases from the Mayo Clinic, of which it is stated that 9 obtained 100 per cent., 2 obtained 95 per cent., and 3 obtained 75 per cent. relief; there were no deaths and no serious complications. A discussion held by the section of obstetrics and gynaecology of the Royal Society of Medicine³ two years ago

¹History of the Canadian Medical Association, 1867-1921. By H. E. MacDermot, M.D., F.R.C.S. (C.). Toronto: Murray Printing Co., Ltd. 1935. Pp. 209.

²Amer. Jour. Med. Sci., December, 1935, p. 811.

³Amer. Jour. Obst. and Gyn., 1934, xxviii., 161.

³Proc. Roy. Soc. Med., 1934, xxvii., 258.

produced a number of case-reports by different surgeons: Mr. A. A. Davis gave his percentage of one-year cures as 50; Mr. Malcolm Donaldson reported 16 cases, of which only 1 failed to obtain relief; of 8 cases reported by Mr. Sidney Forsdike 2 were completely, and 5 partially, relieved, while 1 derived no benefit at all. The last-named speaker emphasised the necessity for care in the selection of cases for operation, pointing out that the comparative ease and safety of the procedure renders it liable to abuse. F. S. Wetherell,⁴ who has had several successful cases, also utters a warning against too ready resort to what is in effect a major abdominal operation accompanied by distinct risks. F. E. Keene⁵ lays stress on the occasional anatomical difficulties and added dangers; the inferior mesenteric vessels, for example, may be situated further to the right than is usual, so that dissection of the nerve plexus from beneath them may be very difficult and fraught with danger to the vessels.

In a paper which we publish this week, Mr. Davis describes 6 cases treated by alcohol injection of the pelvic plexuses in the neighbourhood of the uterus. This method, first used by Blos, has the great advantage over sympathectomy that it is a comparatively minor procedure and does not carry the risks inseparable from laparotomy. The chief drawback seems to be that it does not allow of possible gynaecological lesions being discovered and treated, and these cannot always be excluded, especially in stout women, without operation.

URETERO-INTESTINAL ANASTOMOSIS

A CONDITION which calls for uretero-intestinal implantation is serious enough, without the added inconvenience to the patient resulting from leakage or an ascending infection. Every method so far devised of forming a uretero-intestinal anastomosis has its inherent disadvantages and none is suitable for every case. Some of the methods advocated have resulted in a high percentage of failures, no matter how skilfully the operation has been performed. Others, whilst theoretically sound, are attended by such technical difficulties that only a surgeon with a large experience of this type of work can overcome them. In the December number of *Surgery, Gynecology, and Obstetrics* Dr. Frank Hinman describes a method of implantation in many ways simpler than those advocated by Coffey and no more liable to subject the patient to the risk of complications such as ascending pyelonephritis, compression of the ureters, or leakage of urine or faecal material at the site of implantation. Hinman's method also has the advantage of allowing both ureters to be transplanted simultaneously; it dispenses with the use of ureteric catheters or fine rubber tubes. Pre-operative treatment involves a non-residue diet for at least three days and the clearing of the bowel by castor oil and repeated enemata as well as the use of urinary antiseptics.

The operation consists essentially in the formation of peritoneal flaps and the isolation of the ureters. The peritoneum is slit alongside that portion of the pelvic colon into which the ureter is to be implanted. The outer flap of peritoneum is then stripped up, the ureter found, and held by passing under it a rubber tape. By traction on this tape, the juxta-vesical portion of the ureter is made visible under the peritoneum and a small incision allows it to be reached and divided between ligatures close to the bladder. Convenient sites for

implantation are then selected, preferably not at the same level and marked on the bowel by stay sutures at either end of the imaginary incision. The ureters are then implanted with seven sutures. The method of doing this is to make a clean cut from 2.5 to 3 cm. long in line with the stay sutures, over the muscular coats which are teased back to expose the surface of the mucosa. The sutures are inserted by means of an atraumatic needle passed through the submucosa of the bowel, and through the adventitia of the outer side of the ureter avoiding both lumina. Dr. Hinman gives explicit details, clearly illustrated, concerning the method of inserting these sutures so as to avoid constricting the ureter, and to ensure a good fit. Flaps of peritoneum are then adjusted so as to cover the lines of sutures, care being taken that neither bowel nor ureter is pulled out of line by these flaps, and the abdomen is closed in layers without drainage.

Dr. Hinman reports that 12 patients have undergone simultaneous bilateral implantation by this method; 5 have died, but only 1 of these deaths is directly the result of the operation (bronchopneumonia). Three of the deaths followed an attempt to remove radically at a second operation the bladder, prostate, and vesicles for carcinoma. In none of the 12 patients was there any urinary or faecal leakage at the site of implantation.

ASCHOFF'S SEVENTIETH BIRTHDAY

SOME eighteen months ago British pathologists took the opportunity of his seventieth birthday to pay a tribute to the doyen of their science in this country, Sir Robert Muir. To-day, Jan. 10th, they join with their German colleagues in celebrating the seventieth birthday of Prof. Ludwig Aschoff. For the last 30 years his institute at Freiburg has been the mecca of young men from all countries who have sought inspiration and guidance in methods of pathological research; and none has come away empty-handed. Aschoff's last visit to England was in the summer of 1932, on the occasion of the centenary meeting of the B.M.A. The section of pathology was being addressed by one of his former disciples when the door opened to admit a late-comer whose agitated progress to a seat was somewhat impeded by an overcoat, suitcase, and umbrella. A gleam of delighted recognition was followed by an exchange of solemn bows before the discourse was resumed. On the next day the visitor himself delivered a remarkable address, and was subsequently entertained to lunch by a joyous assemblage of friends and admirers of all ages. Aschoff is a great master of morbid anatomy; there is scarcely a branch of the subject which he has not illumined by his knowledge and enthusiasm. At the age of 70 he retains that living interest in pathology which has proved a stimulus to generations of his students. To hear Aschoff lecture, to see that frail form quivering with the eagerness of exposition, is an experience never to be forgotten. One is reminded of a racing speed-boat, throbbing with the power that shakes the whole craft into impetuous motion. Such men have little to fear from the encroachment of the years.

Mr. F. D. Donovan, surgeon-dentist to H.M. Household, was created a Commander of the Royal Victorian Order in the New Year honours list.

THE tenth British Congress of Obstetrics and Gynaecology will be held at Belfast from April 1st to 3rd under the presidency of Prof. R. J. Johnstone. Details are given on p. 124.

⁴ Amer. Jour. Obst. and Gyn., March, 1935, p. 334.

⁵ Ibid., October, 1935, p. 534.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXXXIV.

PROGNOSIS IN CHRONIC BRONCHITIS AND EMPHYSEMA

IN chronic and slowly progressive conditions prognosis is often as much concerned with the outlook in regard to economic capacity and outdoor activities as with the probable length of life. This is particularly true in patients suffering from chronic and recurrent infections of the air-passages and in those with emphysema, the more so since the patients are usually in the middle and later periods of life when business and family responsibilities are serious. In these conditions prognosis is therefore an important practical problem and demands most careful consideration of a number of factors, to each of which due weight must be given. It is convenient here to consider and discuss these in a definite order, such as would be adopted in the assessment of a particular case.

Family history.—There can be little doubt that a tendency to emphysema may be inherited. It is sometimes found comparatively early in life in the absence of any cause of chronic expiratory stress. In such cases a family history, in parents or collaterals, of chronic bronchial conditions and of early death from respiratory diseases or cardiac failure may be of significance. Cohnheim went so far as to suggest a congenital defect in the elastic tissue of the lung as a factor in the genesis of emphysema. Osler, writing of arterio-sclerosis, referred to "vital rubber," and suggested that in early family incidence of that condition, it could not be explained "in any other way than that in the make-up of the machine bad material was used for the tubing." It is also generally recognised that elastic tissues tend to deteriorate with advancing years.

Personal history may be of the greatest significance in prognosis. The age at which the yearly winter cough started, the number of years during which it has occurred, and the length of the summer intermission, are all of importance. It is usually found that this intermission becomes progressively shorter and its reduction in length is in some degree a measure of the progress of the condition, and therefore of prognosis. In this connexion Kingston Fowler pointed out that the abrupt cessation of the summer intermission, in other words, the persistence of the cough through the summer months in cases where there had previously been some weeks or months of freedom, should always arouse a suspicion of the presence of tuberculosis, and this I have often verified. Since emphysema tends to mask the signs of early tuberculosis this is an important observation, and indeed in the past many cases of tuberculosis in elderly people have masqueraded as chronic bronchitis and emphysema, and have been responsible for widespread family infection. The recognition of its presence may lead to a more serious prognosis in such patients than the previous history would suggest.

Respiratory diseases in early life leading to chronic cough or to fibrosis with bronchial dilatation, either fusiform or sacular, are important factors in leading to chronic expiratory strain and thus inducing widespread emphysema. They certainly must be considered as unfavourably influencing the prognosis in regard to the full expectation of life and in regard

to full economic activity in middle life. In the future it is to be hoped that more attention may be given to convalescence after such conditions, and to special measures such as breathing exercises to obviate or mitigate their after-effects.

Long-continued asthma, especially when associated with bronchial infections, leads to increasing emphysema, and therefore may influence prognosis unfavourably, though spasmodic or allergic asthma, being often intermittent, is less serious in this regard. Coexisting renal or cardiac disease and conditions such as diabetes, obviously tend to render prognosis more serious.

Occupation, habits, and habitation.—Occupations involving exposure to inclement weather, to dust, and to risks of infection are unfavourable, as also are those involving heavy muscular strain or prolonged exertion. Blowing wind instruments has long had a bad reputation in this regard, but it may be questioned if it is altogether deserved, especially if adequate training in breathing and blowing has been given.

Habits are also of some significance in prognosis. Over-smoking, especially the inhaling of cigarette smoke, tends to produce chronic cough and hawking, and patients should be warned of its ill-effects. Alcoholic over-indulgence is also unfavourable by promoting infection, and leading to earlier cardiac breakdown. Habitation is also of great importance, particularly at times other than the summer. Patients with chronic bronchitis and advancing emphysema are most comfortable in dry, warm climates, especially in places where high atmospheric pressures are common. Cold, damp localities are unfavourable, and predispose to further catarrhal manifestations. High altitudes and rarefied atmospheres tend to induce dyspnoea in advanced cases and are contra-indicated.

Social state is a factor of great importance in prognosis. Those in comfortable or affluent circumstances can avoid unfavourable winter conditions by migrating to sheltered areas in this country, such as the south and west coasts of England, and certain parts of the Welsh coast, or to resorts in Egypt, North Africa, the Mediterranean, the West Indies, California, South Africa, or the antipodes. Even those less favourably circumstanced may do much to protect themselves by remaining indoors in damp, foggy, and windy weather, though in older people this may involve weeks or even months without outdoor exercise. Such precautions are clearly impossible for the vast majority of those, both men and women, who have to earn their living by work away from home. In the large industrial towns in this country the daily journey to and from work, with the incidental risks of exposure, infection, chill, and wetting, gravely affects the prognosis in workers who develop chronic bronchitis and emphysema, and the problems offered to medical men in treating and advising precautions in these conditions are difficult in the extreme from the absolute inability of many such patients to follow the advice given.

Symptoms and physical signs.—Symptoms often afford valuable information in regard to prognosis, particularly cyanosis, dyspnoea, and cough. Cyanosis is to some extent a measure of the degree of emphysema and of the extent of the stress on the right

heart resulting from it, though it is in part due to the incomplete oxygen saturation of the blood and the resultant polycythæmia. It should, however, be remembered that patients with this condition may show an extreme degree of cyanosis and yet be able to walk about and work. When the cyanosis is associated with secondary heart failure and œdema its prognostic significance becomes greater and more serious.

Dyspnœa apart from intercurrent acute bronchitis is a serious indication and suggests advanced emphysema or increasing circulatory failure. This may be evidenced not only by effort but also by the number of pillows used by the patient at night. Spasmodic dyspnœa of asthmatic type is common and is often induced or aggravated by intercurrent acute or subacute bronchial infections. Its prognostic significance is difficult to determine. If it is long continued, it is of serious import, both by increasing the emphysema and by promoting circulatory stress.

Cough is often troublesome and serious for similar reasons. It may also cause disturbed nights and so react unfavourably. It sometimes happens that a violent paroxysmal cough develops in which the patient becomes deeply cyanosed, and may even become momentarily unconscious. This is usually an unfavourable prognostic indication. Expectoration varies from little or none to copious amounts of frothy fluid or of tenacious muco-pus. In the latter case it suggests some degree of bronchial dilatation and is an unfavourable sign. Hæmoptysis is rare and should excite suspicion of latent tuberculosis, or "silent" bronchiectasis.

The physical signs are perhaps less significant in regard to prognosis than the symptoms; indeed, Cabot has raised a doubt as to the characteristic barrel-shaped chest being diagnostic of, or the result of emphysema. In any case, the rigid chest of this type in pronounced degree, associated with marked extension of the resonance or hyper-resonance beyond normal limits, obliterating or diminishing the areas of cardiac and liver dullness, connotes considerable diminution of respiratory efficiency, but is less significant in relation to prognosis than signs of right ventricle engorgement or failure. Evidence of tricuspid regurgitation is usually a serious portent. Persistent rhonchi, especially of the sibilant type, particularly when associated with constant bubbling râles at the bases of the lungs, are unfavourable, indicating chronic inflammation of the smaller tubes. Fine râles on deep inspiration heard near the sternum or in the axillæ are frequent in mild cases and of less significance.

Small-lunged emphysema is usually a senile, atrophic, or degenerative process and is associated with less dramatic symptoms until cardiac failure supervenes.

X ray appearances in large lunged cases are somewhat characteristic, showing the increased extent and trans-radiancy of the lung tissues as well as the degree of cardiac enlargement, and these may give some indication of the degree of the condition.

Special tests.—Estimations of the vital capacity may give useful information. This may be very considerably reduced, and a diminution approaching half of the normal should be regarded as serious. Other tests, such as the manometer test, Flack's endurance test, and those devised by Moncrieff are not yet in general use, but can be employed in special cases. Effort response tests and electrocardiographic investigation may also give useful indications,

especially in regard to the degree of circulatory impairment resulting.

Complications and intercurrent diseases.—Chronic renal disease, organic heart disease, raised blood pressure, diabetes, asthma, and pulmonary tuberculosis all affect prognosis in chronic bronchitis and emphysema adversely, while the risks of intercurrent febrile conditions such as influenza or pneumonia are gravely increased.

Treatment.—The results of treatment, especially that designed to prophylaxis of bronchial infections, are of great importance in regard to prognosis. Inoculations with vaccines, either autogenous or stock, may in some cases help greatly in mitigating or even preventing the winter cough. Even one free winter secured by this means or by an escape to more favourable conditions for the winter months in some resorts like those already mentioned may serve to arrest or to delay the advance of the emphysema. Treatment by compressed air baths at a pressure of $1\frac{1}{2}$ atmospheres is often helpful, especially in cases complicated by bronchial asthma. The special respiratory treatments afforded at certain spas, notably La Bourboule, Mont Dore, Reichenhall, and Ems, can also be helpful in lessening the catarrh of the air-passages, relieving asthmatic spasm, and possibly in increasing resistance to infection. It is to be hoped that in the future similar methods may be tried systematically at some of the British spas.

SUMMARY

Chronic bronchitis and emphysema are not in themselves fatal conditions, or indeed even direct causes of death, though they may, either alone or in association, be the means of shortening life, by leading to earlier respiratory and cardiac breakdown, or by rendering more grave the struggle in serious intercurrent disease such as influenza, pneumonia, or pleurisy.

It is difficult to assess the prospects of a particular patient on the lines of the numerical method now used in life assurance offices, especially in America. In this method, numerical debits are given for unfavourable factors such as heredity, unsuitable occupation, bad habits, and progressive physical signs, while credits are given for favourable indications such as social state, comfortable conditions of life, and habitat. A careful assessment on these lines of all the factors considered above might enable some useful conclusions to be formed in a particular case. In general terms, a young patient with hereditary tendencies and with a personal history of respiratory disease early in life leaving persistent lesions and signs is likely to be economically damaged in or before the fourth decade of life, more especially if the conditions of living and work are bad. Such a patient would certainly be rated up for life assurance either by the addition of several years to the age or by the limitation of the assurance to an endowment at 50 years of age, and even then probably with an extra. On the other hand, a patient who does not develop bronchitic tendencies until the middle or late forties, who is comfortably circumstanced, whose work does not involve exposure or unfavourable conditions, and whose symptoms and physical signs are only slowly progressive, may well live nearly the normal span and be enabled to work to the age of 60 or after; but even such a case would probably be rated up for life assurance.

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SPECIAL ARTICLES

THE CONTROL OF MEASLES *

By J. A. H. BRINCKER, M.B. Camb., D.P.H., F.I.C.

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MEASLES has no doubt been with us always. It is a disease usually affecting children and occurring in London in epidemic form biennially from autumn to spring, though it has been known to appear epidemically in hot months and to affect adults severely. In temperate climates and in city populations it reappears with almost clock-like regularity biennially at the end of October. It crops up in one or more separate places and gathers momentum until it reaches epidemic proportions in January and February, after which it subsides. By the end of June it has more or less disappeared, not to reappear in epidemic form until the following October twelvemonth.

EPIDEMIOLOGICAL FEATURES

Measles is a disease which fulfils with remarkable accuracy the conditions of an epidemic cycle (Fig. 1); its waves of prevalence, with their respective rises and falls, are interspersed with periods of absence. A disease affecting a large human community, it has interested many epidemiologists, for it provides admirable material for the detailed study of an epidemic. In London it began to assume special prominence in 1900, and a medical officer was appointed to deal with the health of the London school population. The picture it presented at that time was of a severe epidemic descending on a large school population, affecting within six months some 35,000 to 40,000 children, killing a large proportion of them and maiming more, causing the absence from school of those affected and of their brothers and sisters, necessitating frequent school closure for indefinite periods during the epidemic and paralysing the educational machinery. At that time little was known about the behaviour of epidemics generally and the precautions to be taken to deal with them. Such measures as were adopted were invariably of a panic nature and were always undertaken too late; it was the usual tale of closing the stable door after the horse was out. It was not even suspected that the elder children, infected in school, were, on the closing of the schools, being sent home to infect their younger brothers and sisters who were not attending school. It was assumed that all children would sooner or later contract the disease and that they would have to take their chance of recovery or death. Treatment of patients by attention to general hygiene methods and by the provision of home nursing, or removing them to hospital to prevent complications, was not thought of and children affected were only admitted to the wards of poor-law hospitals when they were dangerously ill.

The study of the epidemiology of measles in London commenced, then, in 1900, chiefly with the observation of school-children and the keeping of statistical records relating to schools. The chief aim in dealing with an epidemic was to stop it or at any rate slow it down. Various measures were adopted with this end in view, such as complete closure of schools, closure of infant departments or of classes in infant departments attended by the younger children, and exclusion of children who had not previously suffered

from the disease, either for the whole period of the epidemic or for the period during which they would be likely to contract the disease—i.e., from the ninth to the sixteenth day after exposure. Complicated rules were drawn up and were faithfully carried out by school teachers, school nurses, and attendance officers, and much praise is due to them for their coöperation in the attempts made to deal with these epidemics.

These precautions, with variations, were carried out during every succeeding epidemic, but they proved futile and were finally given up in 1918. Though these experiments were a failure so far as controlling

Epidemic Cycle of Measles

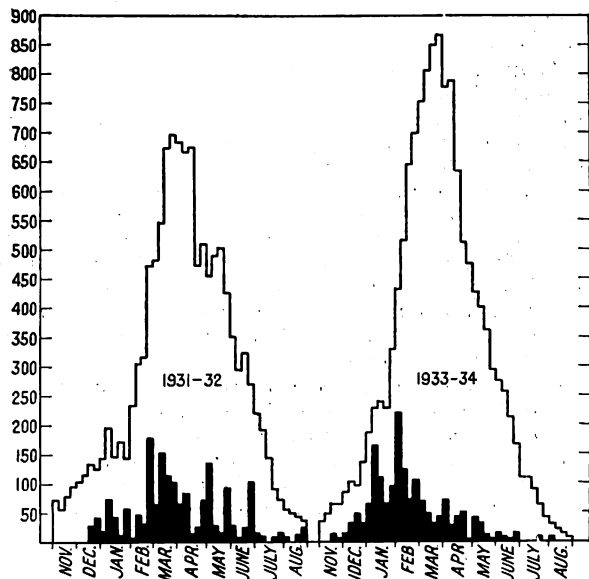


FIG. 1.—Chart showing the number of admissions for measles to L.C.C. fever hospitals (plain area) and inoculations of adult serum (black area) for each week from Nov. 1st to August 31st during the epidemic periods 1931-32 and 1933-34.

the spread of the disease was concerned they taught us many things about the behaviour of an epidemic of measles which are now generally accepted. For instance, in addition to those characteristics already mentioned, it was observed that:—

1. A measles epidemic did not arise in a community of children until the susceptibles rose to 25 per cent. and the epidemic did not stop until this susceptible population was reduced to under 20 per cent.
2. Epidemics when they started did not flare up at once, but required both time, inflammable material, and the right weather conditions to gather momentum.
3. In London, at any rate, measles was a disease affecting children under 7 years of age, and therefore boys and girls in the upper classes of schools were of no account in the spread of the disease.
4. Contacts only became active in spreading the disease from the time the coryzal symptoms developed and the risk of transmitting infection diminished rapidly after the disappearance of the rash; in fact, the greatest risk of communicating infection occurred in the pre-eruptive stage, from the ninth to the twelfth day of incubation.
5. The disease itself did not kill, but predisposed the patient to the great risk of secondary infection by hæmolytic streptococci (resulting in deadly complications such as broncho-pneumonia) and to others such as otitis media and ophthalmia, which, while not so deadly in themselves, could give rise to life-long disability.

* A paper read to the Hunterian Society on Dec. 16th, 1935.

6. The most susceptible age, both for measles and complications, was the pre-school age and by far the greatest number of deaths occurred in the second and third years of life.

P. Stocks later pointed out that the old belief that all children were bound to suffer from measles was not correct.¹ For every 100 children suffering from a clinical attack of measles in a densely populated area about 300 others become temporarily immunised, presumably by subliminal doses of the virus, but of these 300 some 250 lose their immunity again before the next epidemic. It is these children who have lost their immunity, together with those born subsequent to the epidemic, who make up the vulnerable population ready to start the next epidemic.

FAILURE OF QUARANTINE

By 1918 sufficient knowledge had accumulated to demonstrate the necessity of attacking measles by other means. First and foremost it was clear that quarantine, on which so much faith had been placed in the past, and which had been found wanting, was based on erroneous ideas. It was therefore necessary to abandon it finally and completely. As already stated, it was established that measles was particularly dangerous to the pre-school child and the success which attended the experiment of dealing with cases at home on open-air lines and by hygienic methods showed the need for home nursing and medical assistance. These were provided by empowering the borough medical officer of health to call in such aid. By the Maternity and Child Welfare Act of 1918 local health authorities were not only able to provide medical and nursing aid, but also, through the establishment of child welfare clinics, to educate the mother in matters of health and hygiene. In 1910 measles began to be admitted to the fever hospitals of the late Metropolitan Asylums

Increasing Hospitalisation of Measles in London

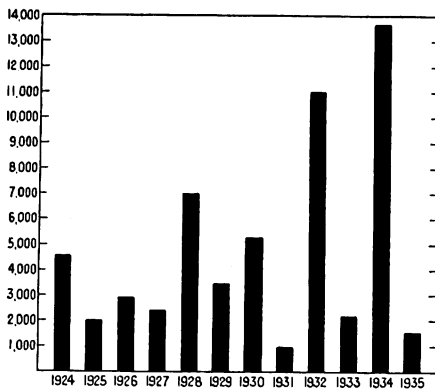


FIG. 2.—Chart showing the total admissions for measles to London fever hospitals (M.A.B. and L.C.C.) from 1924 to the present time.

measles to the wards of the fever hospitals *pari passu* with scarlet fever, the criteria for admission being the type of home and the facilities therein for the proper care of the patient, rather than type of case. To these criteria was subsequently added the age of the patients, in view of the high mortality amongst children under the age of 2. At each of the subsequent epidemics of measles more and more cases were admitted to the fever hospitals (Fig. 2). In the 1931–32 epidemic 11,368 cases were admitted

during the 10 epidemic months and in the 1933–34 epidemic 10 months 12,730 cases, selected in this way, were treated in the wards of the L.C.C. hospitals. By this means many lives were saved, as the case-mortality demonstrates, for of admitted cases in successive epidemics this was 7, 6.5, 5.3, and 5.1 per cent. respectively. It may be of interest to note that patients are treated to a considerable extent in open wards and that under such conditions even cases of severe broncho-pneumonia, otherwise considered hopeless, are nursed back to health.

It is obvious that hospitalisation provides for large numbers of children treatment such as it would be impossible for them to receive at home. In addition to being skilfully nursed in bed in well-ventilated wards with plenty of fresh air, and provided with suitable diet and medical treatment, many accessory lines of treatment are available. Thus many patients are now treated with antistreptococcal serum in the hope of preventing complications. The oxygen tent has been found of great value in dealing with broncho-pneumonia and, in cases of empyema, success has attended the use of the Drinker apparatus to prevent permanent collapse and fibrotic changes in the lung. Skiagrams are now considered necessary for the treatment of the after-effects of measles.

SERUM PROPHYLAXIS

Once measles has been contracted serum is of no use; the aim is either to prevent or to attenuate the disease in those exposed to it. It must therefore be used during the period of incubation. The first attempt to modify measles was made by L. Weissbecker 40 years ago. He employed convalescent measles serum in the early stages of the disease. The first published report on the procedure was made by Nicolle and Conseil in 1918. Since then Degkwitz (1920) and other workers have used convalescent serum to modify the disease. Until the 1929–30 epidemic in London little or no attempt had been made to control the disease by the prophylactic use of immune sera. It is true that in America and Germany attempts had been made to procure immune sera from animals, but all these proved valueless or unreliable and their use was ultimately abandoned. Among such sera were those prepared by Tunncliffe, Ferry and Fisher and Degkwitz. Before the 1929 experiments a few pioneers were at work, the most conspicuous among them being Dr. E. H. R. Harries, then in Birmingham, Dr. D. N. Nabarro at Great Ormond-street Hospital, and Dr. W. Gunn at the Park Hospital. They used serum prepared from the blood of persons who had recently recovered from an attack of measles. During the 1929–30 epidemic in London, however, convalescent measles serum obtained from the blood of such persons was tried on a large scale. This serum proved very efficacious both in preventing an attack and in attenuating the disease. Whether the one or the other was attained depended on the dose of serum given and the time at which it was administered. The varying effect of dosage and the day of injection was very carefully observed and from the experience thus gained any desired result could be attained. Convalescent measles serum thus proved of great value, particularly in preventing children already seriously ill with some other complaint or those about to undergo an operation from contracting the disease after a known exposure. Its use also obviated the need of placing a children's ward in quarantine on the occurrence therein of a case of measles.

Unfortunately most of the patients suffering from

¹ THE LANCET, 1930, i., 796.

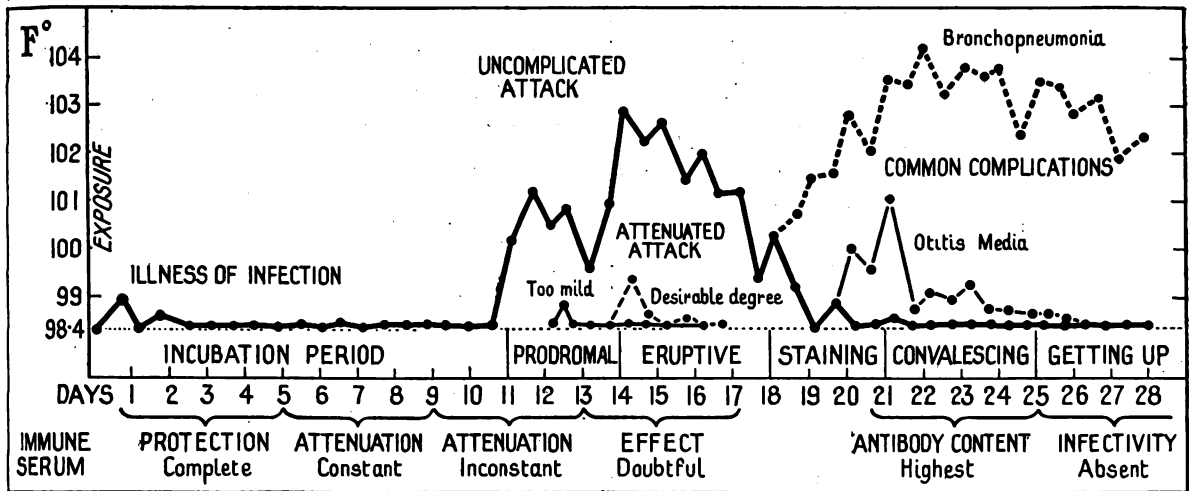


FIG. 3.—Synoptic chart showing the typical course of measles: (1) uncomplicated, (2) with the two commonest complications, (3) attenuated by immune serum (a) to the desirable degree and (b) to an undesirable degree with an attack too mild to confer lasting immunity. The dosage of serum and the time-table of its administration are as follows:—

Nature of serum.	Dose in c.cm.	Dosage factor.	Route.	Prophylaxis.		Treatment.
				Protection.	Attenuation.	
Convalescent ..	5-20.	Age × 2.	Intramuscular.	1st-5th day.	5th-9th day.	} Within 6 days of onset. Dosage factor : age × 4. Route : intravenous.
Normal adult ..	10-40.	Age × 4.	Intramuscular.	1st-3rd day.	3rd-9th day.	
Whole blood ..	Double its serum.	Age × 4.	Intramuscular.	1st-3rd day.	3rd-9th day.	

measles are very young children from whom blood cannot well be abstracted and the number of adults suffering from the disease is so small that the amount of convalescent measles serum available in any epidemic must be very limited. Moreover, to be of value an immune serum should be available at the commencement of an epidemic and not towards its end. Chiefly for these reasons other sources of antibodies had to be sought. It is well known that an attack of measles produces a permanent immunity and that, in London at any rate, most adults have either suffered from measles in childhood or are immune. It was, therefore, suggested that serum obtained from young healthy adults might have some immunising property. To determine if this were so serum was obtained from healthy adults who had volunteered to give it and tested in the same way as convalescent measles serum. This serum is referred to as adult measles serum to distinguish it from the convalescent measles serum obtained from those recently recovered from measles.

I will now summarise the experience which followed the use of this serum culled from an account of the 1931-32 London epidemic. The type of children in whom complete protection is advisable are those who are weakly or debilitated; those suffering from any serious intercurrent disease, infectious or otherwise; and all children under 3 years of age, whatever their condition. For these a minimum dose of 10 c.cm. adult measles serum is recommended. From the age of 3 years onwards the dose is reckoned in cubic centimetres by multiplying the age in years by four. To ensure protection, the serum should be administered within five days of the earliest known exposure to infection; the earlier the injection is made, the more likely is complete protection to follow. The injections should be given intramuscularly, preferably into the vastus externus. The duration of the immunity conferred is roughly three to four weeks.

After the age of 3 years, provided that the physical state is satisfactory, it is desirable to aim not at complete protection but at a modification of the attack of measles if circumstances permit. This is achieved by injecting the serum, in the doses already recommended, later in the incubation period—viz., from the sixth to the ninth day after exposure. The same results may be attained, with resulting economy in serum, by halving the dose and giving the injection within the first five days. The immunity which follows a modified attack appears to be permanent. Of course, if the patient has had measles previously the administration of serum is unnecessary and in fact wasteful.

The statistical analysis of the clinical data in the 1931-32 epidemic makes interesting reading. I will assume that if a susceptible child exposed to measles is given intramuscularly a sufficient dose of this serum within five days of exposure he will be protected, and that, if the same dose is given between the sixth and ninth day of exposure, or half the usual dose within the first five days, the child will suffer from a modified attack of the disease. From the data available it would appear that of every 100 children exposed to risk and not given serum 75 will take measles, whereas of every 100 children given serum less than 14 will fall ill, and that four out of every five attacks of measles would be averted or postponed by the administration of serum.

When we come to deal with the efficacy of adult serum as compared with convalescent measles serum the data must be submitted to careful statistical analysis. To quote from Dr. Gunn's report²:—

"In an ideal scientific test of a prophylactic method one would use the method in alternate cases, e.g., in every school or hospital every other inmate exposed to risk would be given a dose of serum. In such circumstances,

² L.C.C. Report on the 1931-32 Measles Epidemic. London: P. S. King and Son, Ltd. 1933. No. 2996. 2s. 6d.

the protected and unprotected are strictly comparable and simple comparison of results, institution by institution, must give an answer to the question proposed—viz., Does the method of protection in fact protect? Administratively, no such plan could be carried out. We must, therefore, fall back upon the less satisfactory method of using, as controls of the prophylaxis, such unprotected children as, for various reasons, become available."

The conclusions arrived at in the statistical examination of the use of adult serum in the 1931-32 epidemic were as follows:

The total number of observations recorded was 2362. The adult serum series, consisting of 1475 observations, was divided into two groups: the first in which complete protection was desired consisted of 1133 cases, and the second in which attenuation was desired numbered 342 cases. The results of 680 injections of convalescent serum and observations on 207 uninjected contacts during the same epidemic period were utilised to form the control series.

The clinical results of the administration of convalescent and adult serum were compared; the figures were standardised to make allowance for variations in the age-distributions. The analysis showed that convalescent serum is a more potent prophylactic agent than the adult serum for each age-group, but that the difference between them is of statistical significance only in respect of children under 5 years of age. The difference is greatest in the 1-3 years age-group, at which period susceptibility is at its highest. After the age of 5 years there is nothing to choose between the two sera, and after the age of 10 years the effect of either serum on the issue is negligible; at any rate as far as the London school-child is concerned.

When the results with convalescent serum in the infectious diseases hospitals are compared with those of adult serum (similar age-distribution and probability of effective exposure) the significant difference favouring convalescent serum is limited to children under 3 years of age. The difference favouring convalescent serum remains true only in respect of injections given on or before the third day after contact. The attenuating results following one-half the standard dose given before the sixth day are as good as those after the full dose given on or after the sixth day.

Finally, the analysis showed conclusively that adult serum is a valuable measure in measles prophylaxis. In its protective and attenuating action, it is only slightly inferior to convalescent serum and merits a high place in any future policy of measles control.

In the 1931-32 epidemic 24,085 c.cm. of adult serum, roughly 2408 doses, were collected by the medical staff of the L.C.C. and in the 1933-34 epidemic 27,335 c.cm., roughly 2733 doses. These amounts were of course far too small to allow work to be done on an adequate scale. Up to the present, voluntary donors, usually the nursing staff in the L.C.C. hospitals and medical students, have been relied on for blood for the preparation of adult serum. The Council has, however, just given authority for an appeal to be made for donors generally, and has agreed to pay each of them 5s. for providing their blood. In a healthy young adult 250 c.cm. of blood can easily be withdrawn and this provides about half its bulk in serum. By this means it is hoped to obtain sufficient material to carry out the effective control of measles during the current epidemic.

If attenuation can be carried out on a large scale in residential and day schools, measles instead of producing havoc in deaths or physical impairment and causing dislocation of school organisation will definitely be under control. Imagine what a boon this will be to medical officers in public schools where measles, although occurring in older boys and girls, produces considerable dislocation of school attendance. Alternatively, in the case of delicate or sick children in hospitals, or those about to undergo operations,

prevention will result in removal of the risks associated with the disease in those least able to stand up to it. Prevention may also be aimed at in the wards of hospitals to avoid placing them in quarantine after a case of measles has occurred.

Fig. 3 gives in concise form typical temperature charts of cases of measles, uncomplicated and complicated, and of children exposed to measles where serum is used to obtain either complete immunity or attenuation. The temperature may be taken to show the reaction of the body to the poison and is therefore an index of the amount of the poison in the child's circulation. The chart also shows what happens to the child from the date of infection until convalescence is established, along with the doses of serum and the dates on which it is to be given in order to modify the disease.

PLACENTAL EXTRACT

It is well known that infants under 9 months old are generally immune to the common infectious diseases. This immunity is ascribed to their obtaining the antibodies from their mothers. If this assumption is correct these immune bodies must be supplied to the child through the mother's placenta. As a practical outcome of this theory placental extracts have been employed to produce protection or attenuation. In placentas it is apparently the globulin which contains these immune bodies. Globulins have been abstracted from placentas and submitted to test. It has been shown, for instance, that such globulin contains 5 units of diphtheria antitoxin per c.cm. and that, tested by the Schultz-Charlton reaction, it contains quite an appreciable amount of scarlatinal antitoxin. There is no means of testing such globulin for the presence of measles antibodies except by the direct method of using it with a view to the prevention of the disease in contacts. This has been done in some cases with promising results. The substance is called immune globulin. It is being prepared in sufficient quantities in the L.C.C. laboratories to be tried side by side with convalescent and adult human serum and it is hoped to accumulate sufficient data by the end of the coming epidemic to say whether, like adult serum, it can play a part in the control of measles. Various preparations of human immune globulin have been tried in America and a full account of the trial has been given.³

Two commercial preparations of placental extract—i.e., of human immune globulin—are now available; they are (1) Placimmudin prepared by E. R. Squibb and Son, and (2) immune globulin (human) prepared by Lederle. These two products have been submitted to the Council on Pharmacy and Chemistry of the U.S.A. They withheld comment on Squibb's product on the ground that the data supplied were insufficient, but they reported as follows on Lederle's preparation.

1. The product is as efficacious for prevention as convalescent serum.
2. The clinical results show sufficient evidence to warrant the doses recommended for prevention. On the available evidence those for attenuation are questionable.
3. Although it is a promising immunising agent more evidence of its value is needed before it is recommended for general use.

We are hoping to test this preparation in London during the present epidemic.

However inadequate and incomplete this account of the past, present, and possible future of measles may be, I hope I have shown that the older methods

³ Jour. Amer. Med. Assoc., 1935, cv., 493.

of control have failed and that, by means of passive immunisation by serum or placental extracts, we have entered on a promising stage in the battle against measles. Much work on the epidemiology of the disease remains to be done, and those of us to whom the control of infectious diseases in hospitals, schools, and homes is entrusted are fully alive to the need for constant experiment.

I am indebted to Dr. W. Gunn for the loan of the three charts on which the figures are based.

MEDICINE AND THE LAW

Medical Supervision of Special Treatment Establishment

THE London County Council has, by Local Act, statutory powers of licensing massage and special treatment establishments. Under these powers a licence was granted to Mr. Alexander Barthels, of Weymouth House, Hallam-street, with a condition that he should not give ultra-violet ray treatment without the supervision of a medical practitioner. An inspector of the L.C.C. found that the condition was being broken and Mr. Barthels was summoned at Marlborough-street police-court last week. The inspector's evidence was that a patient who was undergoing such treatment was asked if she had seen a doctor and if a doctor had recommended the treatment. The patient answered that she had been to many doctors and had received no benefit and had therefore decided to try Mr. Barthels. There was no question of Mr. Barthels's competence. His legal representative was prepared to elaborate the defendant's skill, but the magistrate observed that his competence was irrelevant. The summons was dismissed under the Probation of Offenders Act on payment of £5 5s. costs to the L.C.C. and on the defendant undertaking not to commit a further breach of his licence. The licensee could hardly contend that he was unaware of the restrictive condition. Deliberate violation of the condition is hardly the proper method of appealing against it.

Fraudulent Conversion by Hospital Secretary

Offences between January and October last year formed the subject of charges at West Sussex Quarter Sessions last week against Major W. I. Rogers, former secretary of the Bognor Regis War Memorial Hospital. He pleaded guilty to various charges of fraudulent conversion, intent to defraud, and omission to make entries as to orders of stamps. It was urged in mitigation of sentence that the accused had formerly borne an exemplary character and had received inadequate pay. The chairman of the bench, Mr. Roland Burrows, K.C., observed that judges had from time to time commented on the fact that it was only persons with an exemplary character who obtained posts where they could commit offences of this kind. Passing sentence of 12 months' imprisonment in the second division, he expressed the view that the checking of the hospital accounts appeared to have been lamentably lax, and that, with better supervision, the defendant would not have found himself in his present position.

Unfitness to Plead

A careful paper on "unfitness to plead," read last year by Dr. W. Davies Higson, medical officer of Liverpool Prison, before the annual conference of prison medical officers, is published in the *Journal of*

Mental Science (1935, cxxxi., 822). He points out that this preliminary question of fitness to plead in criminal proceedings is one with which prison doctors may often have to deal. It is common experience, indeed, that judges pay special respect to their evidence. It might be added that the Atkin Committee on Insanity and Crime stressed the importance of medical officers of prisons having special knowledge of mental disorder. As has sometimes been pointed out, the courts examine a prisoner's fitness to plead more carefully in serious charges like murder than in merely trivial offences, and, on the whole, the proportion of prisoners found unfit to plead is advancing.

The Atkin committee advised that a man should not be found unfit to plead except on the evidence of two doctors at least; one of these would usually be the medical officer of the prison. The committee recommended the retention of the procedure. Mental disorder is sometimes so obvious that trial would be a farce; on the other hand, where there is any element of doubt, it is a strong step to put a man away as a criminal lunatic when he has not been found to have committed a criminal act. The committee approved the standing orders of the Prison Commissioners which recommend that a prisoner be left to stand his trial unless there are strong reasons to the contrary. It remarked that it was aware of evidence of persons of unsound mind having pleaded guilty either to gratify an insane desire for punishment or to avoid inquiry into their mental condition. The evidence which justifies a finding of unfitness to plead consists of showing that a prisoner suffers from such defect or disease of the mind as not to be able to understand the nature of the proceedings against him, or the difference between a plea of "guilty" and a plea of "not guilty," or that he is unable to follow the course of the trial or instruct counsel in his defence or appreciate that he has the right to challenge a juror. On these points the medical witness can state the facts he has observed and the conclusions he has formed, but it is for the jury to decide the issue. The law sees no inherent difficulty in a man or woman being insane and yet fit to plead.

By way of illustration Dr. Higson mentions two instances of the kind of complication which may be introduced. A woman was to be tried at Liverpool assizes for murder of her child. She was brought from Manchester where the medical officer had reported that, during remand there were no indications that she would be likely to be unfit to plead on arraignment. Yet on arrival at the Liverpool assize-court she was in such a state of extreme emotion and mental distress that the medical witness was prepared to give evidence, from further observation, that she was not fit to plead. In the other instance the prisoner had been charged with shooting with intent to murder. His mental condition indicated a straightforward case of paranoia. Medical witnesses for the defence testified that he was unfit to plead. He protested and, his counsel not objecting, the judge told the jury to return a verdict that the man was fit to plead. He was then indicted and, in spite of protests from his counsel, he pleaded guilty; the result was a sentence of 20 years' penal servitude. Dr. Higson records the interesting opinion of one of the medical witnesses, who discussed the case afterwards, that the judge overlooked the unlikely contingency of the prisoner pleading guilty, and that the jury was the more ready to follow the direction to find the man fit to plead because they were anxious to hear what was rather a sensational case.

STERILISATION IN THE U.S.A.

IN May of 1934 a committee of the American Neurological Association was appointed to evaluate in a critical manner the problems of the inheritance of various mental abnormalities and neurological disorders. The committee consisted of Dr. Abraham Myerson (chairman), Dr. James B. Ayer, Dr. Tracy J. Putnam, Dr. Clyde E. Keeler, consultant in eugenics, and Dr. Leo Alexander, research associate. The committee was subsidised by a grant from the Carnegie Foundation. The conditions under which it was appointed and the method of its procedure have something in common with those which related to the recent Departmental Committee on Sterilisation (the Brock Committee). Its report shows that the possible benefits of sterilisation seem to have been exaggerated in America in much the same way as in this country. In a preface the committee states:

We have tried to free our minds from the obsessive traditions of psychiatry and eugenics and this report is, we believe, as unbiased and critical and as nearly objective as we can make it. We hope that the subject matter of the report and the recommendations will be of value both in evaluating past work and as the basis for legislative and especially for research activity.

THE COMMITTEE'S FINDINGS

The findings of this committee are set forth in 12 chapters, of which the last consists of a valuable and comprehensive list of references occupying no less than 16 pages. Arguments commonly used for and against sterilisation receive careful consideration. In the fourth chapter of the report the contention that a need for sterilisation is created by the increase of mental disorders in the United States is examined. An interesting analysis is made of the commitment rate in two States wherein the psychiatric services are highly perfected—namely, Massachusetts and New York. The conclusion is reached that if certain relevant factors are taken into account, there are no valid reasons for supposing that an increase in mental disorders has taken place. The better organised the hospital services, the greater will be the inducement to solicitous relatives to consent to the commitment of mentally abnormal persons; the increasing age of the community, moreover, naturally leads to an increase in the proportion of senile psychoses admitted into mental hospitals.

In a discussion of the relation of genetics to eugenics, the American committee reaches conclusions closely similar to those of the Departmental Committee. They stress the importance of the interaction between hereditary and environmental factors. Recent genetic investigations are quoted in support of the view that "the environment may be conceived as a releasing agent for the manifestation of a character without which, so to speak, the character could not appear." Chapter 7 consists of some shrewd criticisms of widely accepted investigations bearing upon the inheritance of mental diseases and defects. These criticisms pave the way for the committee's chief recommendation, namely, that a—"concerted, co-ordinated and planned long-time research should be instituted in some State which is well-organized psychiatrically and socially, and which has a stable population. A central group headed by a full-time director should determine, after due study, the technique of research, this being the first and all important step. Certain hospitals might be selected to study the mental diseases, feeble-mindedness and epilepsy, through the operations of a genetic group stationed therein. Arrangements could be made for the study of samples of the total

population through schools, universities, factories and such other institutions and social aggregations as may be decided upon."

As is to be expected, the report is sceptical as to the possibility of eliminating crime by genetic methods. "Most writers," they say, "agree that while there may be a constitution (favouring criminality), the effort to breed it out by any eugenical measures is, in the present state of our knowledge, not to be recommended and that more fruitful approaches to crime are to be found in social measures of one type or another." With regard to the relation between genius and mental abnormalities, the committee state categorically that "feeble-mindedness breeds no genius and that we have nothing to fear on that score from the sterilisation of the feeble-minded"; but a different view is taken of the effect of the indiscriminate application of the sterilisation law to manic-depressives. Referring to the work of Lange-Eichbaum, they are satisfied that valid and reliable evidence has been adduced to indicate that sterilisation, applied as a wholesale measure to manic-depressives and their relatives, might well cut off from the race some of its most valued and valuable members.

RECOMMENDATIONS

The committee's most important recommendation, the promotion of further research, has already been noted. But they make some further recommendations which they preface by the three following statements of opinion: (1) our knowledge of human genetics does not justify us in advocating the sterilisation of people who are themselves normal; (2) there is at present no scientific basis for sterilisation on account of immorality or character defect; (3) nothing in the acceptance of heredity as a factor in the genesis of any condition considered by this report excludes the environmental agencies of life as equally potent and, in many instances, as even more effective.

In the light of these statements, the following recommendations are submitted to the American Neurological Association for its considerations:—

(1) Any law concerning sterilisation passed in the United States under the present state of knowledge should be voluntary and regulatory rather than compulsory.

(2) Any law concerning sterilisation should be applicable not only to patients in State institutions, but also to those in private institutions and those at large in the community.

(3) The central machinery for administering any law should be one or several Boards composed chiefly of persons who have had special training and experience in the problems involved. These should study each case on its individual merits and should strongly urge, suggest, or recommend against sterilisation according to its findings. Cases could be brought before such a Board by superintendents of institutions, private physicians, parents, or guardians, or by the patients themselves.

(4) Adequate legal protection for members of such a Board and for the surgeons carrying out such recommendations should be secured by statute.

The committee feels that sterilisation is not to be recommended as a general measure applicable to all persons of whose infirmity a certain diagnosis has been made; they recommend it rather as applicable in selected cases of certain diseases subject to the consent of the patient and those responsible for him. They regard the measure as appropriate to the following conditions in the order given:—

(a) Huntington's chorea, hereditary optic atrophy, Friedreich's ataxia, and certain other disabling degenerative diseases recognised as hereditary.

(b) Feeble-mindedness of familial type.

(c) Dementia precox (schizophrenia).

- (d) Manic-depressive psychosis.
(e) Epilepsy.

A COMPARISON

The general resemblance between these recommendations and those of our own Departmental Committee will be obvious to persons familiar with the latter. Both committees advocate voluntary measures only, they recommend that they should apply to selected cases only, and that facilities for sterilisation should be made available to patients whether in State institutions or not. Both ask for adequate legal protection for the doctors concerned. The chief point of difference resides in the procedure recommended by which patients should apply to be sterilised. The Departmental Committee recommend that wherever possible the patient himself should apply; the American committee wishes to make it possible for superintendents of institutions and private physicians also to apply. The Departmental Committee recommends that each application, supported by two medical recommendations, be communicated to the Minister of Health who should be vested with the power of authorising or vetoing an operation; the American committee recommends that each case be adjudicated by a specially appointed Board. In this respect, its recommendations favour the type of safeguard now in practice in Germany.

VIENNA

(FROM OUR OWN CORRESPONDENT)

AGE-GROUPS OF DOCTORS

IN the course of an inquiry into the possibility of establishing old age pensions for medical practitioners, the Austrian Union of Practitioners (Reichsverband der Aerzte) has collected some interesting material relating to the age-groups of doctors in Vienna. The following Table indicates the general position:—

Age-group.	Male.	Female.	Total.
90-65 years old	550	2	552
64-45 " "	1256	90	1346
44-35 " "	1188	287	1475
34-25 " "	903	212	1115
Under 25 years	1	0	1
—	3898	591	4489

There are 872 (or 15 per cent. of the total) doctors aged 60 years and over, and it is proof of the hard times the medical profession is experiencing that they are nearly all still in practice. During the last 20 years either their savings have been lost or their practices and incomes have dwindled. Among the recommendations brought forward by the Union has been a scheme providing for pensions for all practitioners over 65 on condition they retire from practice and make way for the younger men. But to provide even the very modest pension of 250 Austrian schillings (about £10) a month a large capital fund would have to be collected, and under present conditions this is quite out of the question. The outlook is therefore not very encouraging.

TUBERCULOSIS REPORT FOR 1934

The recently published report of the health department of the Ministry of Social Welfare records that its fight against tuberculosis is conducted from 93 centres working with a staff of 153 doctors, 104 trained nurses, and 71 follow-up nurses, who advise the patients, keep in touch with them, arrange for

hospital or sanatorium treatment where necessary, and organise preventive work among the contacts. In 1934 31,793 new cases were registered, of whom 44 per cent. were men. Rather more than half were over 18 years of age. About 8 per cent., mostly from the country districts, were classified as seriously ill. The cases reported in Vienna itself were not so grave. In 60 per cent. of the cases other members of the family were found to be also infected, in 20 per cent. seriously. Altogether during 1934 280,740 patients attended the centres (65 per cent. at the clinics in Vienna), and of these 167,144 were kept under constant supervision, 8 per cent. being open tuberculosis cases. The 169,070 examinations conducted by the clinics included 11,114 sputum tests, 15,616 biological tests, and 32,296 radiological examinations. The homes of 49,611 patients were visited, and 28 per cent. were condemned as unhygienic, while 70 per cent. were found to be overcrowded—i.e., more than three people living in one room. Of the gravely ill patients only 33 per cent. had a room to themselves, and 16 per cent. of them had to share even their beds. The amelioration of these conditions is the chief aim and work of the clinics.

RECENT LOSSES IN THE MEDICAL FACULTY

Prof. Constantin Bucura, the eminent gynaecologist, has died suddenly at the age of 62. Prof. Bucura, who was of Greek descent, and held the position of chief of the department of gynaecology at the Vienna Polyclinic, where he attracted many students from the Balkan cities. He first won recognition with his work on the theory of conception and fertility, but his most recent researches dealt with cancer of the uterus and ovaries. The death is also reported of Dr. Norbert Dohan who fell a victim to an affection of the blood as a result of his work as chief radiologist of the "Krankenkasse." Dr. Fritz Passim, director of the Children's Hospital of the second district of Vienna, has also died at the age of 67. He was well known as a bacteriologist and for his research work in tuberculosis, especially tuberculous meningitis.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

EDINBURGH ROYAL INFIRMARY

THE ambitious extension and reconstruction schemes undertaken by the management of the Royal Infirmary of Edinburgh are causing considerable anxiety to their promoters. In the annual report for the year ending Sept. 30th, 1935, the managers point out that £150,000 is still required to complete the scheme. A further appeal will shortly have to be made to the public for the necessary funds. The new maternity wing is rapidly taking shape, and the foundations of the new nurses' home have been laid. It is hoped that the full scheme will be completed by Whitsunday, 1937, when the management have promised to take over the functions of the Edinburgh Royal Maternity and Simpson Memorial Hospital. The large new block near the west gate, which is almost finished, is to be used for the treatment of diseases of the skin and venereal diseases, and the wards at present devoted to the treatment of these diseases will be converted into surgical wards to help relieve the ever-increasing surgical waiting-list. Reconstruction of the boiler-house is to cost £22,000, and new X ray apparatus will cost over

£10,000, for the X ray equipment, which was the best obtainable in 1926, is now out of date and will have to be scrapped. The number of patients treated during the year as in-patients was 20,695 (daily average 936), while the 67,583 new out-patients seen during the year represented an increase of 791 over the previous year's figure. Motor accident cases admitted to the wards numbered 366, and half the cost of maintenance of these cases was recovered from insurance companies. The managers report a satisfactory increase in ordinary income. The deficit on the ordinary account amounts to only £28,000, but to this must be added the deficiency on auxiliary institutions, and sums amounting to nearly £27,000 which were expended under the heading of extraordinary expenditure, making a total deficit of over £61,000. Fortunately nearly £75,000 was received in the form of free legacies during the year, and bequests for endowment purposes amounted to over £18,000. In conclusion the managers point out that the large additions being made to what is already the largest voluntary hospital in Britain must lead to a considerable increase in the annual expenditure.

IRELAND

(FROM OUR OWN CORRESPONDENT)

TUBERCULOSIS IN CATTLE

A YEAR or two ago Dr. James Ryan, Minister for Agriculture in the Irish Free State, held out hope that in his work of reducing the number of surplus cattle in the country, special attention might be given to the elimination of tuberculous stock. Last week he informed a congress of the Irish Dairy Shorthorn Breeders' Society that such a scheme was impracticable. His reasons are somewhat puzzling. On the one hand he maintained that there is no need for alarm in regard to tuberculosis, and stated that the investigations that had been carried out had shown that things were not nearly as bad in their herds as they had feared. On the other hand, he said that the elimination of tuberculosis would cost millions of money, would require more veterinary surgeons than they had in the country, and would take many years to accomplish. It is difficult to reconcile these statements. Dr. Ryan's opinion that there is no need for alarm in regard to tuberculosis will not carry conviction. The thousands of tuberculous children in the hospitals throughout the country as the result of drinking tuberculous milk speak too loudly in reply.

PARIS

(FROM OUR OWN CORRESPONDENT)

MEDICAL PRIZES AND AWARDS

THE French Academy of Medicine is the judge and donor of many prizes for the advancement of medical science. This year it has awarded 52 such prizes. At a meeting of the Academy of Medicine on Dec. 10th, a report was presented on the prize-winners for 1935. It is curious how varied are the conditions laid down by the donors for the winning of these prizes. The Ernest Guérétin Prize is awarded to the authors of works based on clinical observations made on the human being, without any sort of vivisection or any experience depending on animals. It needs no superhuman insight to fathom the donor's attitude towards vivisection. His prize was this time shared, Dr. Antonelli, author of a clinical, anatomical, and radiological study of the

"poumon cardiaque au cours de l'insuffisance auriculaire gauche" receiving four-fifths of the prize, and Dr. Liège the remainder for his study of the indications, results, technique, and accidents of blood transfusion. The Baron Larrey Prize for the best work on medical statistics was also divided last year, between Dr. Fricker for his study of the Schick reaction and its relation to endemic diphtheria in France, and Dr. du Bourguet for his study of penetrating wounds of the abdomen. The Lefèvre Prize for the best work on melancholia was not awarded, an ætiological and clinical study of Morel's melancholia being considered worthy of honourable mention, but no more. Applicants for such prizes must send in their theses to the Secretariat of the Academy of Medicine before March 1st of the year in which the prize is to be awarded. The text must be in French or Latin, and the Academy of Medicine is the sole judge. For some prizes the applicants must be anonymous; for others, anonymity is optional; and for others, again, it is forbidden. For some prizes only printed works are considered. With certain important exceptions, foreigners as well as Frenchmen are eligible.

A QUESTION OF HOSPITAL ADMINISTRATION

FOR nearly a year there has been disagreement between the hospital authorities and the majority of the honorary medical staff of the Bermondsey Medical Mission Hospital for Women and Children on a matter of principle. The disagreement has now culminated in the resignation of the members of the honorary staff. We understand that in February, 1935, six members of this staff sent a letter to the hospital committee making a recommendation, concerning an appointment to the resident medical staff, which was disregarded by the hospital committee who disapproved of this method of approach. After prolonged discussion and correspondence the members of the honorary medical staff came to the conclusion that there were certain unsatisfactory features in the organisation of the hospital. For example, there was no provision for a medical committee of members of the active staff, and medical appointments to this staff and decisions on medical matters were often made without consultation with the honorary staff. During the course of the discussions it was indicated to the six members of the staff that the medical director of the hospital proposed to close those departments of the hospital for which these six members were responsible. Members of the honorary medical staff then asked that the administration of the hospital should include a medical committee formed of the medical director and the active members of the honorary staff, for the purpose of advising on medical matters, including appointments to the staff. It was intimated on behalf of the hospital authorities that this suggestion was unacceptable. The six members finally resigned from the hospital staff in October, 1935, because they considered the existence and recognition of a medical committee with the usual functions to be essential in the interests of the hospital and its patients, and they were given the full support of their colleagues on the honorary staff.

The Bermondsey Medical Mission Hospital was founded in 1904 and rebuilt in 1928. It is staffed entirely by women doctors, and contains 20 beds and two private wards for paying patients.

OBITUARY

THOMAS HENNESSY, F.R.C.S.I., D.P.H.

Dr. Thomas Hennessy, who died suddenly in Dublin on Thursday, Jan. 2nd, was well known in the political and medical world. He was Irish secretary of the British Medical Association and arrived at his office as usual in the morning. After attending to correspondence he called at a neighbouring office where he collapsed and breathing ceased. He had suffered for many years from myocardial weakness and had long anticipated a sudden end, although his general condition recently had not given rise to any immediate anxiety.

Thomas Hennessy was born 65 years ago in Limerick, and received his medical education in Queen's College, Cork, and took the Irish double diploma in 1894, having as a student distinguished himself as a Rugby football player. In 1898 he was admitted to the fellowship of the Royal College of Surgeons



DR. HENNESSY

in Ireland, and in 1902 he obtained from the College the Diploma in Public Health. He started as a country practitioner and then acted for a long period as dispensary medical officer of the Clogheen district, Tipperary, where he made himself a fine and more than local reputation. He was an able and particularly sympathetic practitioner and as a result of his strenuous work in practice he developed the cardiac weakness which shortened his life. From the time of his entry to the profession he became interested in medico-political affairs; he was an active member of the council of the Irish Medical Association, and in the special struggles which lay before the Irish medical profession on the introduction of the first National Health Insurance Bill, Hennessy was recognised as one of the most capable and energetic leaders. When, just before the war, the B.M.A. decided to establish a secretariat in Ireland Hennessy was offered the position of secretary, and though loth to leave practice, was influenced by his delicate condition of health to accept the post, which he held to the end of last year when he took up the duties of medical secretary to the Irish Medical Union which replaces both the I.M.A. and the B.M.A. in the Irish Free State. His energy and capacity were notable in his official business and undoubtedly his long experience as a country doctor fitted him for dealing with the problems which came before him, such as, for example, the settlement of the dispute between the medical profession and the National Health Insurance committees concerning the certification of insured persons and their title to benefit. The remuneration of the medical profession and the conditions of a poor-law medical service also presented difficulties in which Hennessy proved to be as reasonably conciliatory as he was

strong in advocacy of what he considered right. It was mainly owing to his personal influence that these struggles terminated satisfactorily, if not completely so, for the medical profession. The War Office was also indebted to his administrative work on the medical war committees, for undoubtedly the part that he played at the deliberations of these bodies led to considerable recruiting of young Irish men to military service of the Crown. It goes without saying that to such a man individual practitioners in difficulty would often turn for advice, and over and above his official work he was hugely occupied in giving advice to junior medical men who found themselves in difficulties, when it was characteristic of him that he gave his assistance without inquiring if those who sought it were members of the bodies to which he was secretary.

All this official work led to no narrow concentration on the professional side of the many questions that came before him. On the contrary, Hennessy always had as his main object the welfare of the public, so that it came about that he was not only the champion of the medical profession in movements for redress of general grievances and the confidential adviser to numerous individual medical men, but also was the persistent advocate of all movements to improve public conditions and promote public health service in Ireland. He may be regarded as having been the father of modern health reform in the Irish Free State. It was mainly through him that the Irish public health council was established in 1919 and all subsequent health reforms may be regarded as having been placed in his hands. He entered general politics in a noticeable manner, being elected to the Dáil in 1927 for South Dublin on the vacancy caused by the death of the Countess Markievicz. While a member of the Dáil he took a prominent part in public affairs. He was a convinced Nationalist and gave his support to the Cosgrave party on the formation of the Irish Free State, and in coöperation with the late Sir James Craig paid particular attention in the Irish Parliament to matters concerning health. He was twice elected to the South Dublin seat and his common sense, honesty, and generally sympathetic attitude were so manifest that there was general regret when he lost his seat some six years later.

Our Dublin correspondent writes: "No account of Hennessy's public work will convey to those who did not know him a due impression of his winning personality. Honourable, broad-minded, far-seeing, nothing really roused his anger but intrigue or unfairness. He would shock his party colleagues by his frank denunciation of policy of which he disapproved. A hearty lover of his own country he had no ill-will to any other country. His judgments were sometimes impulsive but always independent and generous. A strong party-man he would often see little good in the other party, in which nevertheless he had invariably many personal friends, and even in sharp controversy he would disarm hostility by a joke or a smile. A born fighter he never fought but in what he held to be a right cause and never for himself. In recent years his health sometimes gave rise to anxiety and he knew that his life was uncertain, but his courage and activity did not fail. He died as he would have wished, but his sudden leaving is a grave loss to the profession to which he gave his best energies and to his country as a whole."

**GEORGE DOUGLAS MATHEWSON, B.Sc., M.B.,
B.Ch., F.R.C.P. Edin.**

Dr. George Mathewson, who died on New Year's eve, was the son of Mr. James Mathewson, of Dunfermline, and received his medical education at the University of Edinburgh, where he was Mouat scholar and graduated in 1905 as B.Sc., and M.B., Ch.B. He acted as house surgeon at the Royal Hospital for Sick Children, Edinburgh, and house physician at the Royal Infirmary, where he was also clinical tutor in medicine. He was appointed assistant physician to the Leith Hospital and later filled the same post at the Royal Infirmary, while he was also physician to the Royal Public Dispensary in Edinburgh. Elected F.R.C.P. Edin. in 1912, he became lecturer in clinical medicine in the University of Edinburgh and full physician at the Leith Hospital and at the Royal Infirmary. Both the University of Edinburgh and the Royal Infirmary have lost in him a distinguished colleague and able teacher, while his infrequent writings showed the special direction of his studies as a cardiologist, which were recognised also when he became responsible for the organisation of a cardiological department at Salonika during his period of war service. He was a member of the Association of Physicians of Great Britain.

Mr. J. M. Graham, Ch.M., F.R.C.S. Edin., has sent the following appreciation of his colleague:—
“The death of George Mathewson has come as a great blow to the medical profession in Edinburgh. His friends knew that he had successfully passed the crisis of a serious attack of pneumonia. He was apparently well on the road to recovery when, on the last night of the past year, the blow fell, and it was learned that he had suddenly passed away. Although only promoted to be one of the senior physicians at the Royal Infirmary 18 months ago, he had already during his years of service as assistant physician, and as physician to Leith Hospital, established his reputation as a consultant, and as a teacher of clinical medicine. Those of us who knew Mathewson as a student at Edinburgh University, felt that he would be successful in whatever branch of professional work he adopted. Even as a senior schoolboy he had the ability and character, which, without any strong effort on his part, led him to the top of his class. His medical work was on the same high plane, and it was characteristic of him that it should be accomplished easily and with no apparent strain. Above all, he enjoyed his hospital work, and his contact with students. No one could have shown more consideration for the feelings of his patients. Mathewson's first and last thought was for the individual he was treating. That his patients appreciated his kindly methods was obvious to any one who accompanied him during a ward visit. The research work which Mathewson carried out in the clinical laboratory of the Royal Infirmary established his reputation as an authority on the physiology and clinical pathology of the heart. His special knowledge in this branch of medicine was recognised when, during his period of war service, he was nominated to organise a cardiological department for the Salonika Army. Although Mathewson did not contribute regularly to medical literature, what he did write was always original and a definite contribution to knowledge. He was the last man to ‘cultivate’ a reputation. At staff and medical meetings he did not speak often, but his remarks were always very much to the point. His ideas were clear and concise, speaking came easily to him, and he had a flair for the ‘right word.’ He had a natural

gift for teaching, and enjoyed the appreciation of his students. In his own student days the teaching of clinical medicine in Edinburgh had reached a very high standard; Mathewson had already shown that he was well equipped to maintain this fine tradition. Nothing gave him greater pleasure than the knowledge, just before his last illness, that his ward team had reached the final in the Old Residents Cup Rugby Competition.

“Mathewson was always on the best of terms with his colleagues, and with those working under him. He was genuine and loyal in his friendships. He looked back with special pleasure on his period of war service in Macedonia, where many new friends were made and old friendships were confirmed. He was at his best as an active member of several of the famous Edinburgh medical dining clubs. For many years he had been one of the leading spirits in the Centenarian Club, and by none will he be missed more than by his fellow members. His reputation for wit and repartee was acclaimed when he was appointed secretary of the Medico-Chirurgical Club. His minutes at the biennial dinner were looked forward to as the chief entertainment of the evening. It was a pleasure to meet Mathewson in his own house. He was an ideal host. His intimate friends knew how perfectly happy he was in his home life. To his widow and to his children, a daughter and a son, all will offer heartfelt sympathy.”

EDMUND VALENTINE GIBSON, M.D. Edin.

THE death occurred on Dec. 23rd of Dr. E. V. Gibson, of Grange, Guernsey, where he had been in practice for many years. Born in Derbyshire in 1865, the son of the Rev. A. A. Gibson, of Stanley, he was educated at Trent College and entered the University of Edinburgh as a medical student. He graduated as M.B., C.M. Edin. in 1890 and in the same year was appointed house surgeon to the General Hospital, Birmingham. Thereafter he held resident posts at the East London Children's Hospital, at the Devonshire Hospital, Buxton, and was for a time resident medical officer to the Victoria Infirmary, Glasgow. At different times while holding hospital appointments he made interesting clinical communications to THE LANCET, for he was a very competent and well-informed man. He then, some forty years ago, established himself in practice at Guernsey, was appointed surgeon to St. Peter's Port Hospital and to other institutions on the island, and conducted a large practice, latterly in association with his nephew, Dr. R. E. Gibson, and his son-in-law, Dr. W. B. Fox. During the war he served with the rank of surgeon-major in the 1st Royal Guernsey Light Infantry. Dr. Gibson had been a great athlete during his university days, and in later years became an enthusiastic horticulturist, possessing at his villa “Paradis” a remarkably beautiful garden. He was 70 years of age at his death and was on the eve of retirement.

**LILIAN MARY CHESNEY, M.B., Ch.B. Edin.,
D.P.H. Durh.**

THE death took place at the close of the year in Palma de Majorca of Dr. Lilian Chesney, who for a time practised in London as a throat and nose specialist. She was the youngest daughter of General Sir George Chesney, author of the famous skit “The Battle of Dorking,” and received her education in Edinburgh where she graduated M.B., Ch.B. in 1899, afterwards taking out post-graduate courses at Vienna. She held clinical and residential appointments in various institutions before deciding to

practise as a laryngologist, and obtained the D.P.H. Durh. in 1908. On the outbreak of war she went as assistant surgeon with the Russian Unit of the Scottish Women's Hospital and was decorated with the orders of St. Anne and St. Sava. Later she acted as surgeon to the Serbo-English field hospital and recorded her experiences in the *Practitioner* in 1916, especially with regard to typhus fever. In 1920 she went to live in Majorca and from there communicated her impressions to the *Practitioner* of the Balearic Islands as a health resort. Dr. Lilian Chesney, who had many friends in England, promoted that habit of visiting the Balearic Islands for health and holiday purposes, which seems now to be firmly established.

JAMES DUNCAN HART, M.C., M.D., D.P.H. Glasg.

THE death occurred on Dec. 18th of Dr. James Duncan Hart, of North Walsham, Norfolk. A Glasgow man, he was educated at Pettes College and the University of Glasgow, where he graduated as M.B., Ch.B. in 1905. After some post-graduate work at Bonn he served as medical officer to a group of tea estates in Assam, but at the outbreak of war returned to be attached to the 12th Battalion of the London Regiment, and for his war service was more than once mentioned in despatches and awarded the Military Cross. He then settled at North Walsham where he was a member of the staff of the War Memorial Cottage Hospital, a keen supporter of the St. John Ambulance Brigade, and took a prominent part in the social life of the neighbourhood. His death, which occurred suddenly at the age of 52, was deeply regretted in the neighbourhood as was manifested by the large attendance at the funeral.

ROBERT TURNER, M.D. Aberd., F.R.C.S. Edin.

THE death is announced of Dr. Robert Turner at his residence in Llandudno, where he had retired after many years' practice in Bootle. Born in Banff, Dr. Turner received his medical education in Aberdeen and Liverpool. He graduated as M.B., C.M. Aberd. in 1894 and later proceeded to the M.D. degree, acquiring also the diploma of F.R.C.S. Edin. Shortly afterwards he started in practice in Bootle, where he attained success through his skill and his devotion to his work. He also took an active interest in the civic affairs of the borough and acted as mayor of Bootle in 1923-24. He had only recently retired from practice and was in good health until a sudden illness, necessitating operation, proved fatal, in his sixty-sixth year.

JAMES HARRISON, M.R.C.S. Eng., L.S.A.

Dr. James Harrison of Garstang died on his seventy-eighth birthday on Dec. 28th. He was educated at Windermere College and proceeded to St. Bartholomew's Hospital for his medical training, qualifying in 1879 as M.R.C.S. Eng., L.S.A. After a short period of service at the Blackburn Infirmary he settled in Garstang over 50 years ago and took a prominent part in the public and social life of North Lancashire for nearly half a century. He was a member of the Garstang rural council for many years and served as a representative on the Lancashire county council. Shortly after retiring from practice some 15 years ago he was appointed a magistrate for the county, sitting on the same bench at Garstang with one of his daughters, also a county magistrate.

PANEL AND CONTRACT PRACTICE

Light Treatment as Medical Benefit

As a rule when an insurance practitioner administers light therapy he can charge the patient for it and, upon submitting form G.P. 45 to the insurance committee, no question is raised as to its being a specialist treatment. Provided the practitioner satisfies the local medical committee that he has the necessary qualifications he retains the fee he has charged. It may well be argued that the degree of skill required for the administration of light treatment is not beyond the scope of a general practitioner—it must be remembered that the treatment which a practitioner is required to give to his patients comprises all proper and necessary medical services other than those involving the application of special skill and experience of a degree or kind which general practitioners as a class cannot reasonably be expected to possess—but it is not every practitioner who possesses, or can reasonably be expected to possess, the apparatus for applying light treatment. While too it is a truism that every case is dealt with on its merits and that a decision on a particular case does not necessarily enunciate a principle, it is equally clear that a decision on a case may establish a presumption that the service is or is not within the scope of a practitioner's obligations, as for example the treatment of varicose veins by sclerosing fluid, and it is probably this reason which has led local medical committees to regard light treatment as outside the scope of medical benefit.

The Croydon local medical committee, however, are taking rather a different view, and in fact a few years ago decided that six cases of electrical treatment

were not of a specialist character. That committee, in respect of two recent cases of sunlight treatment, have given their unanimous opinion that the service in question was not of a kind which involved the application of special skill or experience of a degree or kind which general practitioners as a class cannot reasonably be expected to possess. The grounds upon which their opinion is based are that while in certain cases electrotherapy would have to be regarded as a specialist service the treatment referred to in these cases is not within that category as, with the modern apparatus now available, any practitioner can reasonably be expected to perform such service. The insurance committee have concurred in the view of the local medical committee and the insured persons concerned will have their fees repaid to them.

The Insurance Acts Committee have already given their view that the general practitioner must be expected to keep reasonable pace with advances in medical science and, in a letter, they go so far as to indicate that ultra-violet ray treatment is not necessarily a specialist treatment, but that the question whether in particular cases the service is within the scope of a practitioner's agreement can only be decided in the full light of all the local circumstances. Most committees still hold that light treatment is outside the scope of medical benefit.

More Friendly Guidance

In another of what he calls his "written chats" the clerk of the London insurance committee devotes three paragraphs to the evergreen subject of medical records. While congratulating practitioners upon the improvement in the return of these

documents he rather cunningly takes advantage of the opportunity to indicate that the cases of ten particularly bad offenders have had to be referred to the medical service subcommittee. Then follows a reminder about the immediate transmission of records upon the death of insured persons. Practitioners are required in such circumstances to forward the medical record at once, without awaiting a formal notification from the committee, but the name of the deceased is not removed from their list until the fact of the death has been verified by the approved society. The action of some practitioners in refraining from sending in the records of persons known to be dead means in effect that they are claiming credits in respect of persons for whose treatment they are no longer responsible, and, what is worse, in respect of whom the practitioners' fund is receiving no money. But the question may be asked whether a record should be sent in if the patient has died while not under the care of the practitioner. Certainly it should, even if the endorsement has to be "said to have died in hospital" because, as indicated above, the fact of

death has to be verified before other action is taken by the committee. Sometimes the first intimation received by the practitioner is the form G.P. 34, but in other cases he will know of the death long before the society or the committee does.

The letter goes on to remind practitioners of the desirability of notifying acceptances at frequent intervals—the terms of service prescribe "within seven days." The practitioner who sends in no acceptances at all during the quarter and then on the last day sends over 50 is making things hard for himself and putting sand in the mechanism of the Act. On prescribing appear two little notes which almost deserve to be called wise-cracks: (1) don't issue prescriptions on the committee's form to persons about whose title to benefit you have doubt, and (2) if you wonder whether you may properly prescribe a particular preparation don't ask the patient or the chemist to inquire. "We try," says the clerk, "to reply tactfully to inquiries by insured persons, but this is a matter which should be dealt with between the doctor and the committee direct."

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdrs. to Surg. Cpts.: J. A. O'Flynn, G. V. Hobbs, and J. G. Boal.

Surg. Comdr. (rettd.) A. A. Sanders, O.B.E., to rank of Surg. Capt. (rettd.).

Surg. Lt. A. K. Stevenson to rank of Surg. Lt.-Comdr.

Surg. Lt.-Comdrs. (D) to Surg. Comdrs. (D): E. G. Adams, F. R. P. Williams, T. E. Brevator, and J. L. Edwards.

Surg. Comdrs. K. A. I. Mackenzie to *President* for course, H. L. Douglas to *Titania*, M. Barton to *Apollo* (on coming), and J. C. Sinclair to *President IV*.

Surg. Lt.-Comdrs. G. Phillips to *President* for course, and A. N. Forsyth to *Victory* for R.N.B., to *Boscawen* for H.M. Naval Base, Portland, and to *Drake* for R.N.B., addl.

Surg. Lt. T. McCarthy to *President* for R.A.F. Medical Officers' course.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt.-Comdrs. to Surg. Comdrs.: G. McCoull and St. G. B. D. Gray.

Surg. Lt. A. E. Williams to *Royal Sovereign*.

Surg. Sub-Lt. R. V. Jones to *Victory* for R.N. Hosp., Haslar, for training.

ARMY MEDICAL SERVICES

Col. C. R. Millar, D.S.O., late R.A.M.C., having attained the age for retirement, is placed on ret. pay.

Lt.-Col. J. C. L. Hingston, from R.A.M.C., to be Col.

ROYAL ARMY MEDICAL CORPS

To be Bt. Cols.: Lt.-Cols. J. A. Manifold, D.S.O., and B. Biggar.

Maj. E. A. Sutton, M.C., to be Lt.-Col.

Short Serv. Commissions: Lts. R. S. Vine and J. E. Jameson to be Cpts. Capt. L. E. Odlum resigns his commn.

SUPPLEMENTARY RESERVE OF OFFICERS

Capt. R. W. Agnew resigns his commn.

TERRITORIAL ARMY

Col. L. A. Harwood, T.D., from 56th (1st Lond. Div.), is apptd. A.D.M.S., The Lond. Div.

Maj. J. Melvin, M.C. (late R.A.M.C., Militia), to be Maj.

Capt. R. W. Agnew (late R.A.M.C., Supp. Res.) to be Capt.

Capt. C. M. Forbes to be Maj.

To be Bt.-Majs.: Cpts. R. W. Gemmill, E. C. Woodhead, J. E. McCartney, and T. F. Arnott.

Lt. R. M. Allardye to be Capt.

Capt. D. R. W. Burbury relinquishes the appt. of Divl. Adj. 47th (2nd Lond.) Div. and Sch. of Instn.

Capt. D. C. McC. Ettles, from 56th (1st Lond.) Div., to be Divl. Adj., Lond. Div. and Sch. of Instn.

Supernumerary for service with the O.T.C.: G. E. Gray (late Offr. Cadet C.S.M., Queen's Univ. Belfast Contgt. (Med. Unit), Sen. Div., O.T.C.) to be Lt. for duty with the Med. Unit of that Contgt.

ROYAL AIR FORCE

Wing Comdr. J. Rothwell to R.A.F. Station, Manston, for duty as medical officer.

Flight Lt. L. Freeman is promoted to the rank of Squadron Leader.

Dental Branch.—Flying Offr. W. V. A. Denney is promoted to the rank of Flight Lt.

INDIAN MEDICAL SERVICE

Col. A. W. M. Harvey to be Maj.-Gen.

Lt.-Col. S. G. S. Haughton, O.B.E., to be Col.

Lt.-Col. B. C. Ashton to be Bt. Col.

The undermentioned officers retire: Col. C. A. Gill and Lt.-Col. J. D. Sandes.

(For New Year Honours in the Services see THE LANCET, Jan. 4th, p. 60.)

COLONIAL MEDICAL SERVICE

The following have been appointed medical officers, West Africa: Dr. G. T. Balean, Dr. D. L. Cran, Dr. C. A. McComiskey, Dr. J. L. McLetchie, and Dr. W. R. Phillipps. Dr. W. T. C. Berry has been appointed medical officer, Nyasaland; Dr. I. T. Dickson, medical officer, Malaya; Dr. J. F. Jarvis, medical officer, Tanganyika; and Dr. F. J. Wright, medical officer, Kenya. Dr. H. J. O'D. Burke-Gaffney becomes senior pathologist, Tanganyika; Dr. H. Fairbairn, sleeping-sickness officer, Tanganyika; Dr. G. Maclean, deputy director of medical services, Tanganyika; Dr. A. Rankine, director of medical services, Trinidad; and Dr. H. C. Towell, medical officer, Uganda.

DEATHS IN THE SERVICES

The death occurred on Dec. 31st, at Caorleon, Monmouthshire, of Lieut.-Colonel WILLIAM ALBERT MORRIS in his 79th year. He was educated at King's College, London, and qualified L.S.A. 1879, L.R.C.P. Edin. 1880. Two years later he joined the R.A.M.C., becoming major in 1894 and colonel in 1902. He served in Burma in 1886-87, and on the North West Frontier (Tirah) in 1897-98. He retired in March, 1912, but was re-employed during the European war. A frequent contributor to the medical press Colonel Morris is best known as editor of the "Treatise on the Transport of Sick and Wounded Troops," written by Surg.-General Sir Thomas Longmore.

CORRESPONDENCE

HYPERVITAMINOSIS D

To the Editor of THE LANCET

SIR,—In connexion with this subject, and Dr. Thatcher's paper thereon in last week's issue of THE LANCET (p. 20), attention may be directed to an investigation by L. L. Madsen, C. M. McCay, and L. A. Maynard on Synthetic Diets for Herbivora, with special reference to the Toxicity of Cod-liver Oil,¹ which may not be generally accessible. Sheep, goats, rabbits, and guinea-pigs were fed on a "synthetic" diet, consisting essentially of regenerated cellulose, starch, sucrose, yeast, salts, and lard, with cod-liver oil. Upon it sheep were reared successfully, goats with moderate success, but rabbits and guinea-pigs with much less success. Eventual failure in the last-named animals, and to a less extent in goats, was caused by the development of paralysis due to degeneration of the skeletal muscles, fatty liver being a constant finding in all species. It was demonstrated that the cod-liver oil was the chief causative agent in production of the lesions. It was found that for sheep and goats a daily intake of 0.7 g. of oil per kilo of live weight caused death within 93 days, 0.35 g. within 226 days, and only when the oil ration was reduced to 0.1 g. was no ill-effect produced.

The authors state that, while furnishing no evidence applicable to the human species, the results should serve to re-focus attention on the reports of Agduhr, Mouriquand and Michel² have also reported a relationship between cod-liver oil intake and the development of scurvy, the oil apparently in some manner "antagonising" the vitamin C. Cod-liver oil may not, therefore, be the entirely innocuous substance it is generally supposed to be.

I am, Sir, yours faithfully,

Greenwich, S.E., Jan. 4th. R. TANNER HEWLETT.

"MORBUS BRITANNICUS"

NEW LABELS AND LARGE TEXT-BOOKS

To the Editor of THE LANCET

SIR,—Bearing in mind that text-books of medicine now run to a couple of thousand pages, cost a couple of pounds, and become "out of date" every three or four years, I read with gloom of Dr. Kofoed's new "morbus Britannicus" which he describes in your last issue. Surely Dr. Kofoed has only described the signs and symptoms of acute vagotonia, which in this case is of occupational origin, occurring in stokeholds and ships' galleys for the most part. Such a well-known syndrome could scarcely be called a new specific disease; nor, in my opinion, can it be termed Britannic, since I have seen at least one very acute case amongst Chinese firemen, in four voyages to the East as ship's surgeon. The aetiology as given in the note would seem to be indefinite: in my case the weather was calm but very hot, and the men were of good physique, neither starved nor given to excesses (at sea), and with only their normal lues infection. I have yet to learn that a salt-free diet can excite such fulminating symptoms, but if this is so then this cause did not operate, for these men ate plenty of salt meat, and especially salt pork, every day. Possibly some sudden deficiency in water absorption is a more probable explanation, with

cerebral and medullary stasis. The late Prof. W. E. Dixon was wont to remark that the blood was geared for albumin, sugar, and salts. It is not, however, geared for water, especially during heavy labour in stokeholds and galleys, with great loss of body fluid.

Dr. Kofoed mentions some of the other causes of the acute vagotonic syndrome, but others also are well known—psychical, inflammatory, reflex, and toxic—as in some cases of death in the first stage of chloroform anaesthesia, in which the patient may die of vagal cardiac inhibition, like a dog. Vagotonia varies in degree from the stage fright of the European actor or examinee to the ascaris-excited acute abdomen of, for example, the North Borneo Murut. The ascaris, indeed, is an important cause of the acute syndrome in the tropics, a cause which Dr. Kofoed does not mention. The syndrome is as classical as that of inflammation itself: bradycardia followed by tachycardia; colic followed sometimes by diarrhoea; pallor; sweating; constriction of the pupil followed by dilatation; spasms of voluntary muscles with some rigidity of the recti which may later become board-like; nausea and possibly vomiting. The spasms may be due to an extension of the excessive stimulation to the voluntary musculature. The diagnosis of the cause is facilitated by giving hypodermically a full dose of atropine (gr. 1/50), or better by washing atropine into the veins. This procedure quickly relieved the acute stokehold cramps and colic, but would have less effect when there is some continued peripheral stimulation. Hot salt baths relieve by the action of heat only, and, of course, no salts are absorbed from water through an oily epidermis.

Would it not simplify medicine if certain unnecessary and confusing labels were now discarded, and if new labels were reserved for new specific diseases, and then only given after a long probationary period? Could one, in conclusion, dare the opposition of publishers, and plead for a standard loose-leaf textbook of practical medicine, compiled and revised annually by the most authoritative committee of international expert physicians, to enable us more easily and at less expense to see the true growth of medicine in its proper perspective?

I am, Sir, yours faithfully,

London Fields, E., Jan. 6th.

A. J. COPELAND.

SYPHILITIC ANÆMIA OF PERNICIOUS TYPE

To the Editor of THE LANCET

SIR,—In your last issue (p. 24) Dr. C. R. Box and Dr. A. M. Gill report an instance of severe anaemia of the pernicious type associated with, and apparently due to, an active syphilitic infection in an adult; and they remark on the rarity of such cases. It is certainly difficult to understand why, if syphilis can produce such a condition, more is not known of it. I felt the force of this dilemma some three years ago in the case of a child of 5 years old with a strongly positive Wassermann reaction and a comparatively severe hyperchromic anaemia. Rapid recovery occurred with no medication other than mercurial inunction. As there was no evidence to suggest the presence of a hæmolytic anaemia undergoing spontaneous recovery, it was tempting to presume that the anaemia was due to poisoning of the bone-marrow by the syphilitic infection. I could, however, find no analogous instances in the literature, and at a gathering of a dozen paediatric

¹ Cornell University Agricultural Experiment Station, Memoir 178, June, 1935 (Ithaca, New York).

² Compt. rend. Soc. Biol., 1922, lxxiv., 1170.

physicians no one could recall having seen a similar case. The following is a brief account of the case:—

A girl, aged 5 years, was brought to the Paddington Green Children's Hospital for pallor which was said to have been getting rapidly worse for three weeks. She was admitted owing to her anæmic appearance. On the day of admission her father gave the information that he had had syphilis and that the patient, when an infant, had had a short course of treatment for the same disease. The girl was well-grown and well-nourished, and showed no stigmata of congenital syphilis. Her complexion was very pale, showing no bronzing of the skin, and her blood-serum showed no icteric tinge. Her blood W.R. was strongly positive. The liver and spleen were not enlarged. The red blood-cells numbered 2,150,000; hæmoglobin, 50 per cent.; colour-index, 1.16; and the white count was 8500 with a roughly normal differential count. The film showed marked poikilocytosis, anisocytosis, and polychromasia; there were a few nucleated red cells.

In this case no treatment was given except the ununction of a drachm of blue ointment daily. In ten days time the red cells had increased by over a million, and the hæmoglobin by 30 per cent. Reticulocytosis amounted to 3.4 per cent. At the end of three weeks' treatment the red cell count was 4,420,000, and the hæmoglobin was 95 per cent. The appearances of the blood film were those of normal blood.

I am, Sir, yours faithfully,

London, W., Jan. 4th.

REGINALD MILLER.

AGRANULOCYTOSIS

To the Editor of THE LANCET

SIR,—I am much interested in the article on agranulocytosis by Goadby, Worster-Drought, and Dickson in THE LANCET of Oct. 26th, 1935. The occurrence of meningitic symptoms, with changes in the cerebro-spinal fluid in this condition, recalls to my mind a similar condition reported four years earlier (New Eng. Jour. Med., 1931, ccv., 1238) by W. Dameshek and myself. This was the first report of central nervous system changes in a typical case of so-called infectious mononucleosis. Since then two other cases of a similar nature have been called to my attention: one reported by A. H. Johansen (Acta med. Scand., 1931, Fasc. 3, lxxvi., 269), the other reported to me personally this fall by Dr. Edwin M. Cole from the Massachusetts General Hospital.

It was stated in my original communication that changes in the cerebro-spinal fluid occur simultaneously with the cerebral and meningeal symptoms of certain internal diseases. Further, it was emphasised that symptoms referable to the central nervous system occur in the blood diseases, such as the leukaemias and infectious mononucleosis. The close parallelism between the cellular changes in the cerebro-spinal fluid and the changes in the leucocyte counts in the latter case was considered to be significant. It was also mentioned that there might be a close relationship between this disease and the syndrome variously called aseptic, epidemic, and acute lymphocytic meningitis.

During the past few years considerable interest has been shown in the literature in lymphocytic meningitis, as well as other obscure central nervous system infections. This was stimulated by the work of Armstrong (Pub. Health Rep., 1934, xlix., 1019), and of Rivers and Scott (Science, 1935, lxxxi., 439), which indicates that a filtrable virus is the causative agent of acute lymphocytic meningitis. These experimental investigations tend to show that this disease is a clinical entity.

Whether or not this is a fact remains to be seen. However, it was stated in my original article that "the concept of an aseptic meningitis is at best a vague one and almost as all-inclusive as the term encephalitis." The concept was emphasised at that time that these conditions were symptomatic of some generalised systemic disease. The article by Goadby and Worster-Drought illustrates again the familiar phenomenon of the association of central nervous system changes with systemic disease. The aetiology of agranulocytosis as well as of infectious mononucleosis is of course unknown. However, from the standpoint of the cerebral manifestations, which apparently may occur in both diseases, a fairly close relationship may be seen. It is conceded; nevertheless, that the report concerning the case of agranulocytosis is indicative of a chronic infection of the central nervous system, whereas my original case of infectious mononucleosis dealt with an acute cerebral disorder.

While it may be true that this report on agranulocytosis is unique in the literature, it seems to me that the crux of the whole situation lies in the larger concept of various systemic diseases of known and unknown aetiology, giving rise to changes in the central nervous system.

I am, Sir, yours faithfully,

SAMUEL H. EPSTEIN.

Harvard University Medical School, Dec. 23rd, 1935.

THE UNDESCENDED TESTICLE

To the Editor of THE LANCET

SIR,—We read with interest Mr. Denis Browne's letter in your issue of Dec. 28th, in which he suggested that there are two distinct types of undescended testes: (1) those suffering from a delay in development, which would be suitable for hormone treatment, and (2) those suffering from a congenital deformity, in which hormone therapy is contra-indicated and which are amenable only to surgery. The hormone treatment of undescended testes being at present only in the experimental stage, such suggestions are indeed of value.

It appears that one of Mr. Browne's criteria for classing a case as congenital deformity in which hormone treatment should not be undertaken is the presence of a hernial sac. Of the 9 cases which he quotes from our series as being unsuitable for hormone treatment for this reason, three (Nos. 14, 17, 20) had no detectable hernia before treatment and the testes descended successfully into the scrotum. Hernias developed during treatment, and operation will now be required for their relief. Of the remaining 6 cases which were unsuccessful, 3 (Nos. 9, 28, 29) had palpable hernia before treatment and 3 (Nos. 27, 30, 31) had not; thus the absence of a hernia does not necessarily indicate that the result will be successful. Nor is the failure to palpate the testes a sign that hormone therapy will be unsuccessful; in three of the cases under discussion (Nos. 27, 28, 29) the testes were not palpable and the result was unsuccessful; but in patient No. 1 both testes were palpable and a successful descent of both testes was obtained.

It would seem then that Mr. Denis Browne's suggestions do not get us much farther. We hope, however, that further experience of hormone therapy will disclose more definitely the type of case suitable and the type unsuitable for the treatment.

We are, Sir, yours faithfully,

A. W. SPENCE,

E. F. SCOWEN.

Dunn Laboratories, St. Bartholomew's Hospital and College, E.C., Jan. 4th.

PURKINJE'S EIGHT-RAYED STAR*To the Editor of THE LANCET*

SIR,—If on awaking in the morning the eyes be closed and covered with the hands the centre of the field of vision will appear alternately as light or dark in accordance with its sensitisation from the periphery. If when the disc is light it be observed very carefully there will be seen in it a black eight-rayed star (*) similar to an astigmatic clock. The centre of the star is the centre of the field of vision. This corresponds to the eight-rayed star seen by that minutely accurate observer, Purkinje, by intermittent light and pressure on the eye. It has been very generally neglected, probably because of its artificial appearance. One of the main rays is vertical and another horizontal.

I am, Sir, yours faithfully,

F. W. EDRIDGE-GREEN.

Board of Trade, S.W., Jan. 2nd.

MEDICAL EDUCATION AND BLOOD EXAMINATION*To the Editor of THE LANCET*

SIR,—This is an age of mechanisation, the individual is being superseded by the machine, and individualism in medicine is being submerged by specialism and team-work. This is no doubt a natural and rational development, owing to the great advance in medicine and its allied sciences during recent years. It is impossible for any individual to keep in touch with every modern development in its relation to medical practice, and the student of the present day has come to rely upon a multitude of counsellors—the pathologist, the bacteriologist, the biochemist, the radiologist, &c.—for a diagnosis.

The great majority of students however are destined for general practice, and many may find themselves isolated in country districts, where the props upon which they have hitherto relied are not readily accessible, and they have to depend upon their own resources. Does the clinical training at the medical schools supply all the requirements of the general practitioner? The average doctor, when examining a medical case, takes the temperature, counts the pulse, perhaps looks at the tongue, listens with the stethoscope to the heart sounds and the respiration, possibly takes the blood pressure, and, if there seems to be a special reason, examines the urine for albumin or sugar. If any further investigation is required, the patient is referred to a specialist. He certainly does not examine the blood, and yet the diagnostic value of a blood examination cannot be over-estimated. Without a satisfactory blood examination the diagnosis of the large class of blood diseases, which are frequently met with in practice, is impossible, and in some conditions, which are fortunately comparatively rare, such as agranulocytosis and pernicious anæmia, the patient's life may depend upon early diagnosis and prompt treatment.

Leucocyte counts, total and differential, are of assistance in the diagnosis of acute infections, and additional information can be derived from the Ameth count, an infection of any kind, whether accompanied by leucocytosis or not, being associated from its beginning with a "shift to the left." In addition to this, the leucocyte count is a valuable guide in prognosis, and gives an indication of the course of the disease and its response to treatment, the necessity for operative interference in pyogenic infection, and the prospect of recovery. It is no exaggeration to say that there is no other method of

clinical examination by which so much valuable information can be derived.

The technique of blood examination is simple and easily acquired. No elaborate equipment is needed: a microscope—preferably with a mechanical stage—a hæmocytometer, a hæmoglobinometer, slides, and a few stains, are all that are necessary. The process is interesting, even fascinating, and with practice a complete examination need not take much more than an hour. Why should not students be taught to use this method of clinical examination as a routine? Clinical clerks might be required to supply a record of the blood picture in their notes in every case for which they are responsible.

I am, Sir, yours faithfully,

HERBERT H. BROWN.

Worthing, Jan. 1st.

DUODENAL ULCER TREATED WITH HISTIDINE*To the Editor of THE LANCET*

SIR,—The following case may be of interest to your readers.

The patient, a Moslem, aged about 30, reported to me on Jan. 30th, 1935, with "chronic dyspepsia," stated to be of six years' duration. His history was typical of that of a duodenal ulcer. I had the patient radiographed for a barium-meal series on March 4th, and the duodenal cap showed an ulcer crater, which persisted after the stomach had emptied. From Jan. 30th to June 7th I treated him with alkalis and a gastric diet, without any improvement; if anything his "hunger pains" were getting worse. On June 8th I started him on a course of 24 daily intramuscular injections of histidine, using Hoffmann-La Roche's Larostidin, put up in 5 c.cm. ampoules. The injections are practically painless. After the fifth injection the patient stated that his hunger pains had disappeared, so I told him he could try whatever diet he fancied. The next day his gratitude seemed unbounded, as he said he was able to have a good square meal for the first time without any discomfort whatever. Since then he has eaten a normal diet and not had any trouble, except some flatulence occasionally.

In my opinion this case deserves special attention in view of the long history, the distinct pathological state of his duodenum, as seen in the skiagram, and the quick relief obtained, which up to now (nearly six months afterwards) seems a permanent cure. I had the patient radiographed again by a barium meal series on Dec. 4th and there is no evidence whatever of the previous ulcer. My thanks are due to Dr. P. A. Pierce, radiologist of the Ripon Hospital, without whose help I should not have been able to obtain the evidence of ulcer and the results of the treatment.

I am, Sir, yours faithfully,

Simla, India, Dec. 19th, 1935.

A. H. BARTLEY.

THE BRIGHTNESS OF THE POST OFFICE MESSENGER*To the Editor of THE LANCET*

SIR,—In your leading article of Jan. 4th on the Marriage of Public Health and Agriculture you state incidentally that "H. H. Bashford reports that Post Office messengers get bigger (though not necessarily brighter) from year to year." I think it should be made clear that the words between parentheses are editorial and not mine. From a long personal experience, I have an extremely high opinion of the brightness of the average Post Office messenger.

I am, Sir, yours faithfully,

H. H. BASHFORD,

Chief Medical Officer, G.P.O.

Jan. 4th.

*** We have the same opinion, and the interpolated words are no contradiction of it, taken in their context.—ED. L.

AMMONIUM CHLORIDE AS A DIURETIC

To the Editor of THE LANCET

SIR,—In their paper on "A Mercurial (Novurit) Suppository as a Diuretic for Cardiac Œdema" (THE LANCET, Jan. 4th) Dr. Parkinson and Dr. Thomson also discuss the use of ammonium chloride as an adjuvant and mention that "there is difficulty in disguising its salty taste." This difficulty as well as the other drawback frequently seen with the use of ammonium chloride in the ordinary form—viz., the occurrence of digestive disturbances—have been overcome by the introduction in 1930 of a preparation called Gelamon, which has been prepared by Halpern under the auspices of Saxl and Erlsbacher and which contains the ammonium chloride in a special form. The main features are the adsorption of ammonium chloride on gelatin which is then hardened in formalin. When given in this form not only is the taste of ammonium chloride effectively disguised but also there is scarcely any incidence of indigestion, as gelamon is not, or only to a negligible extent, decomposed in the stomach. Since its introduction it has been used on a large scale in the First Medical Clinic of the University of Vienna, and on the ground of what I have seen in that hospital as well as in my private practice I can recommend it.

Gelamon is manufactured as pastilles, each containing 0.4 g. of ammonium chloride; 15 pastilles daily and spread over the day should be given (preferably after meals) during the 48 hours preceding the administration of the mercurial diuretic, during the day of the administration, and in some cases also during the first day following the administration. Our observation has been that not only can a considerable increase in the diuretic effect be obtained, but that also cases which did not respond to the administration of a mercurial diuretic or had become refractory may become responsive by means of the use of gelamon in the way indicated.

I have been in communication with the makers of gelamon for the last few months and understand that gelamon will be obtainable in this country shortly. I am, Sir, yours faithfully,

Wimpole-street, W., Jan. 6th.

A. SCHOTT.

AN ALUMINIUM KETTLE

To the Editor of THE LANCET

SIR,—Might I suggest to Dr. Elwell, whose letter appeared in your issue of Dec. 28th, that he should refer to a monograph I wrote in 1931, entitled the "Danger of Food Contamination by Aluminium," published by Messrs. John Bale, Sons and Danielsson, Ltd. In this he will see that I emphasised "stiffness" as one of the most frequently recurring symptoms of aluminium artificially introduced into the system, and that I found this specially affected the back of the neck and head—similar symptoms, in fact, to those he describes in his patient. In the last five years, during which I have been working intensively on this subject from the clinical point of view, I have traced these symptoms in so many patients to aluminium that I can definitely assure Dr. Elwell that this metal was responsible in his particular case.

I am, Sir, yours faithfully,

R. M. LE HUNTE COOPER.

Harley-street, W., Jan. 6th.

* * * Dr. Elwell's patient, who suffered from stiffness and pain in the back of the neck and head, had been in the habit of drinking daily some eight to ten breakfast cups of tea, the water for which was boiled in an aluminium kettle; and the symptoms ceased

when the kettle was no longer used. Dr. Le Hunte Cooper is satisfied from similar experience of his own that aluminium was responsible in Dr. Elwell's case, and he refers to a monograph which he wrote four years ago. At that time we found it difficult to attribute the groups of symptoms he described to the use of aluminium cooking vessels, especially as the work of the American authors whom he quoted in support of his deductions was not confirmed either in the U.S.A. or in this country. Dr. G. W. Monier-Williams, reviewing the subject last year for the Ministry of Health, agreed that there may be individuals who are susceptible even to small doses of aluminium, but found no conclusive evidence that this is so.—ED. L.

BRITISH POSTGRADUATE MEDICAL SCHOOL

THE organisation of the British Postgraduate Medical School provided for a dual teaching staff. There was to be a permanent and whole-time staff, usually referred to as "A staff," and a visiting and part-time staff referred to as "B staff." "B staff" were either to deliver courses of lectures or to take charge of wards for such periods as could be arranged. With the exception of a few lectures in the refresher courses, the whole work of the school since it began has been carried on by "A staff."

With the beginning of the New Year a start will be made with the appointment of members to "B staff." To some extent the method by which the services of "B staff" can be utilised is at present experimental. It will be extended or altered in the light of requirements.

In the department of medicine Lord Horder has agreed to take charge of a ward for a period of ten weeks from Feb. 1st. During this period he will direct the work of the ward with the assistance of the permanent staff, and will conduct two teaching clinics weekly. He will be succeeded by Lord Dawson, who has consented to take charge of beds from May 1st to July 15th. These clinics will be held on Wednesdays and Fridays from 2-4 P.M. In addition, the following courses of lectures have been arranged. Commencing on March 2nd Dr. Gordon Holmes, F.R.S., will give a course of lectures on cerebro-spinal syphilis. Subsequent courses of lectures are to be given by Dr. W. S. C. Copeman on arthritis, and Dr. R. A. Young on non-tuberculous pulmonary diseases.

In the department of surgery Prof. E. W. Hey Groves will commence a series of lectures and demonstrations on fractures on Feb. 7th. These lectures will be given on Fridays commencing at 2.30 P.M. Later in the session Sir James Walton will lecture on the surgical treatment of dyspepsia, Sir Henry Gauvain on surgical tuberculosis, and Mr. Tudor Edwards on thoracic surgery. Each course will consist of about six lectures and will include some practical work as well as demonstrations of cases and of methods of treatment. During the course on surgical tuberculosis visits will be paid to Alton and Hayling Island. Full details of these courses will be published later.

During the absence of Prof. G. Grey Turner at the International Surgical Congress in Cairo Sir Thomas Dunhill and Prof. G. E. Gask are in charge of the surgical wards and the clinical instruction of the school.

Colonel L. W. Harrison has been appointed honorary consultant in venereal diseases at the school.

ROYAL INFIRMARY, BRADFORD.—The board of management intend in the near future to institute a dermatological department at the New Royal Infirmary, Bradford, in connexion with which a new appointment of dermatologist will be made.

INTERNATIONAL SOCIETY OF SURGERY

CAIRO: DEC. 31ST, 1935, TO JAN. 4TH, 1936

(FROM A CORRESPONDENT)

THE eagerly anticipated Tenth Congress really began when two large parties of members embarked on the *Champollion* and the *Mariette Pacha* at Marseilles on Boxing Day. To make contact with friends of other nations, to get to know those whose names are notable in surgery, and to discuss informally problems of mutual interest, is one of the most useful functions of gatherings of this sort; and as sailing conditions were ideal, the opportunity was fully used. In addition a certain amount of committee work was undertaken by the official delegates during the voyage.

The morning of the 30th found us landing at Alexandria, where the British Fleet lay at anchor in the bay. Here our Egyptian hosts took charge of us, and the sight-seeing included a visit to the great new Hôpital Roi Fouad I, situated on the confines of the town and overlooking the Mediterranean. Built of native stone with lavish use of marble, it is after the plan of the Martin Luther Hospital in Berlin and provides for 450 beds, of which 150 are for paying patients. Each of the six floors is painted a different colour and all the wards have hot and cold water, telephones, and wireless. Each of the ward floors has its operating suite with some novel features; but these scarcely seemed to compensate for the poor lighting arrangements. It was interesting to notice that most of the sanitary fittings and equipment had been supplied by British firms. The nurses are all German and everything was spotless.

At Cairo the arrival of about 340 visitors all at the same time rather taxed the resources of some of the hotels, but by midnight most troubles had been smoothed out, lost luggage was restored to rightful owners, and calm reigned once more. Between 8 and 9 next morning the bureau of the Society at the Medical Faculty was besieged and when registration was completed it was found that 392 congressists, not including those from Egypt, were in attendance. With the notable exception of Italy nearly every country in Europe was represented, and there were members from as far afield as Australia, South America, Canada, Malaya, Japan, and China. The Russian Government sent five interested and active members with Dr. Limberg as delegate and leader. One of the members from Finland was on his way to join a Red Cross unit in Abyssinia. Seven members made up the British contingent, while Mr. Gordon-Taylor was expected, en passant, on his way home from the primary fellowship examination in India. Everyone regretted the absence of Prof. Anton von Eiselsberg, who had to forego the presidency for reasons of health.

AN UNCEREMONIOUS OPENING

On the morning of Tuesday, Dec. 31st, the Congress was officially opened in the great hall of the University at Guizeli. This is situated some little distance out of the city and is a beautiful and spacious auditorium which had been finished only the previous evening. As one approached the grand entrance it was obvious that something unusual was afoot, for the vicinity was besieged by hundreds of students distinguished as much by their excitement and volubility as by the picturesque tarbush which they all wear. A sort of catafalque, erected to the memory of students killed in the recent riots, had been erected

just in front of the entrance, and this was the centre of most of the excitement. Early comers reached the hall without much trouble, but late arrivals were considerably jostled and some of the less robust visitors were alarmed. Later the demonstration became noisy; tremendous shouting greeted all new-comers; cars were boarded and the occupants harangued with cries of "Down with England," "Egypt for the Egyptians," &c. Inside the hall while the delegates were assembling on the platform there was an extraordinary incident. A student carrying a large coloured photograph of the students previously killed in the riots mounted the platform and holding the photograph at arm's length called for a two minutes' silence, and then exhorted the large body of students inside the hall who shouted and cheered. It struck the visitors as remarkable that all this was allowed to take place without the slightest interference from the police or officials of any sort. Eventually Prince Mohamed Aly Hassan with his suite arrived and occupied the Royal Box, after which the ceremony was allowed to proceed without much interruption, although the departing guests, and especially those on foot, had to run the gauntlet amid a vociferous mob yelling and shouting.

But these incidents did not upset the Congress in any way. As president of the organising committee, the Minister of Public Instruction welcomed the visitors in an appropriate speech in French, which was thoughtfully circulated in that language and in Egyptian. ALY IBRAHIM Pasha spoke as the dean of the faculty, while Dr. VEREOOGEN (Brussels), chairman of the international committee, Prof. DE QUERVAIN (Berne), past-president, Dr. MAYER (secretary-general of the Society), and Dr. SCHOE-MAKER (The Hague), the president, all made speeches outlining the work and the activities of the Society.

SURGERY OF THE PARATHYROIDS

After the excitement of the morning the first scientific session, held at two o'clock in the afternoon, was somewhat of a relief. The subject was the surgery of the parathyroids, and the reports of the openers BINET (Paris), BAUER (Breslau), and BRAINE and CHIFOLIAN (Paris) were succinct and admirable. Among the supporters LERICHE (Strasbourg) contrasted operations on the parathyroids with those on the sympathetic, and also referred to the importance of the possible consequences from interference with the blood-supply of the glands. His remarks were received with acclamation. JIRASEK (Prague) and HABERLAND (Cologne) made suggestive contributions, and HUSSEIN (Cairo) focused on the difficulty of the subject by comparing the problem with that of the nine blind men describing the elephant! PERERA Y PRATS (Madrid) suggested that in Recklinghausen's disease of bone removal of the parathyroid was definitely indicated, in scleroderma it was useless, in polyarthritis it was of very doubtful value, while in Glénard's disease and muscular asthenia it was to be considered on its trial. In this discussion PLOTKIN (Moscow) also took part.

THE SURGICAL SIGHTS OF CAIRO

On New Year's morning visits were paid to the departments of the medical school and to the hospitals. Among the former the anatomical and the pathological departments were found most interesting. Prof. Bernard Shaw is developing a very complete department in pathology with many new features. From about 200 autopsies a year he is building up complete reports with preservation of the naked-eye specimens and histological slides all

indexed and filed for subsequent study. The museum of the department is already wonderfully complete, and the series of case specimens and specimens with clinical, X ray, and microscopical records was of great teaching value.

The work in the operating theatres of the Kasr-el-Aini Hospital was varied and interesting. Egyptian surgeons have a unique experience of splenectomy and of the complications of bilharzia. Examples of both conditions were dealt with skilfully and with proper restraint. The frequency of the Egyptian splenomegaly is almost certainly due to intestinal infection which is very common in this country. The results have much improved since it has become the practice to spend three or four weeks in preliminary treatment and to operate only when the enlarged spleen is an encumbrance and danger from its size and liability to injury. In one series of several hundred operations the mortality was 12 per cent., and in a recent consecutive series of 30 cases there was no death. One surgeon at another hospital carried out six splenectomies the same morning. Silk or linen thread is used for the pedicle. Provided that concomitant disease has been conquered the late results are very encouraging.

The Kasr-el-Aini Hospital is really a fifteenth century building which for many years was the palace of the governors. After the conquest of Napoleon it was made into a hospital with Baron Larrey as chief surgeon. In recent years it has been altered and renovated, and with its 1500 beds it serves the purposes of a modern hospital very well. The wards are clean and bright, and the thick walls of the old palace and the wide central corridors help to keep them cool in summer. To the visitor unaccustomed to Eastern conditions the way in which the patients squat on the beds and other unusual attitudes are rather remarkable, but they seemed wonderfully content and we were informed that they make good patients and, generally speaking, put up an excellent resistance at least to operations and traumatisms. The senior nurses are all British-trained, but an additional nursing staff of Egyptian girls is being recruited. The new hospital on the Island is making rather slow progress, but the new out-patient department is now complete and is remarkably efficient. It deals with enormous numbers and on the day before our visit there were 3457 attendances of which over 800 were new patients.

LUMBAR SYMPATHECTOMY

On Thursday the scientific session began just after 8 A.M., the subject for discussion being lumbar sympathectomy. BRAENCKER (Hamburg) gave an excellent presentation of the anatomy, illustrated by some beautiful slides. LERICHE (Strasbourg) followed, and his well-known interest in this subject led him to treat of the related pathology of occlusive arterial diseases. GONZALEZ AGUILAR (Santander) suffered from the fact that few of the congressists seemed to understand Spanish. YOUNG (Glasgow) made a plea for the consideration of periarterial sympathectomy in properly selected cases, and LAMBERT ROGERS (Cardiff) made an effective contribution on clinical and anatomical grounds. Many of the speakers quoted experimental work in which arteriography had played a useful part.

There were so many communications that the discussion had to be postponed until Saturday afternoon.

SURGERY OF THE COLON

Friday's discussion was opened by CORACHAN (Barcelona), GREY TURNER (London), SOUPAULT

(Paris), and SCHOEMAKER (The Hague). There were no less than 52 names down as subsequent speakers, but, perhaps fortunately, only 19 actually turned up. For the most part the openers gave a general review of the subject, reflecting the practice of their several countries. There seemed to be unanimity about the wisdom of a suitable regimen for uncomplicated diverticulosis, operative treatment being reserved for the complications. DE QUERVAIN (Berne) caused amusement by suggesting that diverticulosis seemed peculiarly liable to occur in diplomats! JIRASEK (Prague) spoke in excellent English and made his points very clearly. He stated that in non-malignant disease a permanent spasm of the distal part of the bowel was prone to follow an unphysiological colostomy. HABERLAND (Cologne), speaking in German, was equally explicit, and drew attention to a new form of suture for the colon. SHELTON HORSLEY (Richmond, Va.) showed some interesting lantern slides. He stressed the value of multiple stage operations in colonic resection, and spoke of the use of continuous intravenous infusions of 5 per cent. dextrose in Ringer's solution and the preliminary use of vaccines. LEVEUF (Paris) gave a clear exposition of the value of colectomy for aggravated colitis, and reported some very good results. FINSTERER (Vienna) was listened to with great attention while he related the results of a fine series of partial colectomies which he had carried out for spastic and other conditions of the great bowel. The results of hemisection, whether right or left, had been most satisfactory, but total colectomy had proved dangerous and unsatisfactory in his hands. One speaker (GREY TURNER) hit upon the idea of projecting short epitomes in the French language under each of his headings—these were interspersed between ordinary slides showing specimens, and seemed to be a satisfactory method of overcoming some part of the language difficulty.

THE END OF THE CONGRESS

On Saturday, from 8 to 12, we are promised a full programme of lantern demonstrations and the like under the auspices of a special meeting of the Egyptian Medical Society. The afternoon, from 2 to 6, is reserved for presentations and reports on bilharzia by ALY IBRAHIM Pasha, dean of the medical faculty, and NAGUIB MAKAR, both of Cairo, and a large number have signified their intention to take part in the discussion. As though that were not enough any discussion postponed from previous sessions is then to be dealt with!

Our hosts have been most hospitable, and every night save one there have been banquets or receptions. The banquet of closure on Saturday, given by the Egyptian surgeons, will really be a welcome end to a strenuous though happy and useful week.

The social side of the Congress has been well arranged, and besides the evening functions, like the President's reception at the magnificent Palace Hotel in Heliopolis, trips on the Nile to the Barrages of the Delta and, of course, an excursion to the Pyramids, were thoroughly enjoyable. All the "sights" of Cairo seemed to be open on presentation of the membership card, and we were met by kindness and cordiality on every side. All who participated in this successful congress must be grateful to Dr. Aly Ibrahim Pasha and his able secretaries, Dr. M. Khalil Bey and Dr. M. Kamel Hussein.

WORK OF THE INTERNATIONAL SOCIETY

There have been long meetings of the international committee to discuss several problems connected

with the future of the Society. The propositions put forward were to create associate members with all the privileges of the Society but without voting power up to 50 per cent. of the titular members of each country, and to establish a journal to be published every two months in order to keep up the interest of the members in the affairs of the Society between the triennial meetings. On account of the fall in value of the franc the subscription for future members is to be raised to 450 Belgian francs. These propositions were later brought before the general assembly and adopted—but not without some opposition regarding the new journal, because many members felt that there were already more than enough.

Invitations for the next congress were received from Russia, Switzerland, and Austria, and it was eventually decided to hold the next congress in Vienna in 1938 under the presidency of Dr. Rudolph Matas of New Orleans. Prof. Sauerbruch (Berlin) and Dr. Hybbinette (Stockholm) were elected vice-presidents, while the re-election of the treasurer, Dr. Lorthioir, and the urbane and indefatigable secretary, Dr. L. Mayer, were received with acclamation. The subjects selected for discussion at the next congress were (1) the surgery of arterial hypertension, (2) bone-grafting, and (3) tumours and cysts of the lung.

The name of Prof. Lambert Rogers, of Cardiff, was added to the British committee.

PUBLIC HEALTH

Grading of Milk by the Total Bacterial Count

In the *Medical Officer* of Dec. 28th Dr. J. B. Howell writes of the unreliability of grading milk according to the total bacterial count and the test for coliform organisms. He finds that if he sends identical samples to different laboratories for total bacterial counts the reports are often quite different. In one extreme case (already quoted in our columns 1934, ii., 1074) two identical samples sent to the same laboratory produced counts of 147,300 and 3,400,000 per c.cm., while a different laboratory receiving a third sample reported that the content was only 9270 per c.cm.

Anyone with experience of total bacterial counts on milk will not be much surprised at such results; it is common knowledge that the total count technique, which is based upon the unwarranted assumption that every colony originates from a single organism, is full of pitfalls. But Dr. Howell is hardly being fair when he assumes that variations in count are due to the failure of bacteriologists to "faithfully and carefully carry out the suggested procedure." The factor which probably has most effect on the bacterial content of milk is the state of the weather, which is altogether outside the bacteriologist's control. In hot weather bacteria grow extremely rapidly in milk, and unless samples are transported from the sampler to the laboratory packed in an efficient ice-box there may be big variations in bacterial growth within a short period of transit, depending upon the different temperatures attained. Apart from considerations of temperature, it is extremely hard to standardise a test of this type. There are mechanical faults such as errors in the graduation of pipettes to be controlled; there are the difficulties of standardising culture medium prepared from such variable constituents as meat and peptone; and there is a difficulty to which Dr. Howell draws attention—that of breaking up cell aggregates in the milk. This is attempted by shaking the sample in a bottle; but it is impossible to disintegrate all clumps and chains of organisms suspended in milk, and any endeavour to standardise the degree of disintegration by standardising the amount and method of shaking will achieve but slight success. Finally, in preparing total counts the failure of the human element plays an important part, both during the various manipulations and in the final counting. However well-trained and conscientious laboratory technicians may be, their errors cannot be reduced to a level at which they can be ignored.

Undoubtedly there are strong grounds for agreeing

with Dr. Howell that little reliance can be placed upon a report of the bacterial content of a milk when judging the grade or quality of a sample. Comparison of a series of counts made at frequent intervals enable one to form a reasonable estimate of the standard of cleanliness under which the milk has been produced, but the results of a single test are usually worthless.

Generally speaking, two fundamental objections can be levelled against the present method of grading milk. The one is based upon the inherent inaccuracies of the total count; the other is that owing to the laboratory accommodation necessary, and the high degree of technical skill required, for performing the count a very definite economic limit is set to the number of times an individual milk-supply can be tested in the course of a year. Obviously, therefore, an improved method of grading milk depends not upon improving or elaborating the technique of the total count, but rather upon devising a test simple and cheap enough to be applied to an individual supply of milk—daily if need be—and one which eliminates some of the above inaccuracies.

We may look for some further light on choice of technique when Prof. G. S. Wilson's expected report is issued. In the meantime reference should be made to the method of judging the quality of milk for pasteurisation, which was first suggested by Anderson and Meanwell,¹ and is also advocated in a report by Scott and Wright² which has just reached us. Bacterial counts are made of the milk before and after pasteurisation and the results are correlated, attention being chiefly paid to the post-pasteurisation count. It has been shown that while the pre-pasteurisation count is largely influenced by weather conditions and may be a very unreliable index of the hygienic conditions of the farm, the post-pasteurisation count of heat-resistant organisms depends largely upon the cleanliness of production, these organisms coming mainly from badly sterilised apparatus.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED
DEC. 28TH, 1935

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2052; diphtheria, 997; enteric fever, 20; acute pneumonia (primary or influenzal), 1076; puerperal fever, 35; puerperal pyrexia, 72; cerebro-spinal fever, 14; acute poliomyelitis, 8; encephalitis

¹ Anderson, E. B., and Meanwell, L. J.: *Jour. Dairy Research*, 1933, iv., 213.

² Scott, A. W., and Wright, N. C.: *Hannah Dairy Research Inst. Bull.*, No. 6, 1935.

lethargica, 5; dysentery, 33; ophthalmia neonatorum, 42. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Jan. 3rd, 1936, was 3728, which included: Scarlet fever, 1164; diphtheria, 1212; measles, 315; whooping-cough, 465; puerperal fever, 19 mothers (plus 14 babies); encephalitis lethargica, 279; poliomyelitis, 3. At St. Margaret's Hospital there were 14 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox or enteric fever, 39 (3) from measles, 4 (1) from scarlet fever, 28 (7) from whooping-cough, 40 (6) from diphtheria, 59 (20) from diarrhoea and enteritis under two years, and 80 (14) from influenza. The figures in parentheses are those for London itself.

The mortality from influenza, of which the total has begun to rise, is scattered over 47 great towns, Liverpool reporting 5, Manchester 4, Bolton and Leicester each 3, no other great town more than 2. Liverpool reported 15 deaths from measles, Manchester 7, Warrington 3. Liverpool also had 5 deaths from whooping-cough. The deaths from diphtheria were reported from 24 great towns: Liverpool 5, Darlington, Manchester, Newcastle-on-Tyne, Sheffield, Wallasey, Warrington, and Birmingham each 2.

The number of stillbirths notified during the week was 233 (corresponding to a rate of 60 per 1000 total births), including 31 in London.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

- ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.**
TUESDAY, Jan. 14th.
Pathology. 8.30 P.M. (Middlesex Hospital, W.) J. McIntosh: Some Centrifuge Experiments. P. Fildes, B. C. J. G. Knight, G. M. Richardson, and G. P. Gladstone: Metabolism of *Staphylococcus aureus*. L. E. H. Whitby and M. Hynes: Supravital Staining of Leukæmic Leucocytes. An Apparatus for Rapid Red Cell Measurement. R. W. Scarff and M. McGeorge: Blood Pressure in Experimental Renal Lesions. W. H. Mason: Pathogen-selective Cultures. L. C. Bousfield: Findings in Joint Fluids from Cases of Rheumatoid Arthritis. K. M. Eisenberg: Microscopy of Living Virus Material. A. C. Counsell and L. C. Martin: Pathological Specimens.
- WEDNESDAY.
History of Medicine. 5 P.M. Mr. T. B. Layton: History of the Knowledge of the Anatomy of the Nose. Dr. T. Wilson Parry will read a paper by the late Dr. Dan McKenzie entitled Surgical Perforation in a Mediæval Skull with Reference to Neolithic Helling.
- THURSDAY.
Dermatology. 5 P.M. (Cases at 4 P.M.) Cases: Dr. M. S. Thomson: 1-2. Cases for Diagnosis. 3. Angioma Serpiginosum. 4. Complete Leukonychia. Mr. H. Corsi: 5. Pigmented Hairy Mole developing in an Adult.
- Neurology.* 8.30 P.M. Prof. B. Brouwer (Amsterdam): The Spleen, the Liver, and the Brain.
- FRIDAY.
Obstetrics and Gynaecology, Radiology. 8 P.M. Prof. D. Dougal and Dr. R. E. Roberts: Radiology in Relation to Obstetrics. Dr. L. N. Reece, Dr. H. C. H. Bull, Dr. W. G. Mackay, and Dr. Archibald Durward will also speak.
- MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.**
MONDAY, Jan. 13th.—8 P.M., Pathological Meeting.
- ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, Manson House, 26, Portland-place, W.**
THURSDAY, Jan. 16th.—8.15 P.M., Col. C. A. Gill: Some Points in the Epidemiology of Malaria, arising out of the Malaria Epidemic in Ceylon.
- PADDINGTON MEDICAL SOCIETY.**
TUESDAY, Jan. 14th.—9 P.M. (Great Western Royal Hotel, W.) Mr. G. G. Turner: Income-tax in Medical Practice.
- TUBERCULOSIS ASSOCIATION.**
FRIDAY, Jan. 17th.—5.15 P.M. (Manson House, 26, Portland-place, W.) Dr. Noel Bardswell, Dr. J. G. Johnstone, and Miss M. C. Marx: After-care of the Tuberculous in London. 8.30 P.M., Dr. James Maxwell: Intestinal Tuberculosis.
- BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck-street, W.**
THURSDAY, Jan. 16th.—7.45 P.M., Special General Meeting. 7.45 P.M., Dr. J. F. Brailsford: Radiological Demonstration of Developmental Abnormalities of the Skeleton.
- FRIDAY.—11 A.M., Visit to the X Ray Department of St. Mary's Hospital. 5 P.M., Case Demonstration and Discussion. (Medical Meeting.)

- NORTH LONDON MEDICAL AND CHIRURGICAL SOCIETY, Royal Northern Hospital, N.**
WEDNESDAY, Jan. 15th.—9 P.M., Dr. Bellingham Smith: Continued Fever.
- SOCIETY FOR THE STUDY OF INEBRIETY.**
TUESDAY, Jan. 14th.—4 P.M. (11, Chandos-street, W.) Dr. W. Norwood East and Dr. H. J. Norman: The Relations of Alcoholism and Crime to Manic-depressive Disorder.
- BIOCHEMICAL SOCIETY.**
FRIDAY, Jan. 17th.—3 P.M. (United Dairies Research Laboratories, Wood-lane, W.1), Short Communications.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

- ROYAL COLLEGE OF SURGEONS, Lincoln's Inn-fields, W.C.**
FRIDAY, Jan. 17th.—5 P.M., Prof. A. F. MacCallan: The Surgery and Pathology of Trachomatous Conjunctivitis. (Hunterian Lecture.)
- UNIVERSITY COLLEGE, LONDON.**
THURSDAY, Jan. 16th.—5 P.M., Mr. F. G. Young, Ph.D.: Glycogen and the Metabolism of Carbohydrates. First of four lectures.
- HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.**
WEDNESDAY, Jan. 15th.—2 P.M., Dr. R. S. Frew: Cough. 3 P.M. Dr. A. Signy: Prophylaxis of Whooping-cough and Measles.
Out-patient Clinics daily at 10 A.M. and ward visits (except on Wednesday) at 2 P.M.
- LONDON SCHOOL OF DERMATOLOGY, 5, Lisle-street, W.C.**
TUESDAY, Jan. 14th.—5 P.M., Dr. G. B. Dowling: Pityriasis Dermatitis.
WEDNESDAY.—5 P.M., Dr. I. Muende: Histopathology of Some Common Skin Diseases.
- FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.**
MONDAY, Jan. 13th, to SUNDAY, Jan. 19th.—ST. JOHN'S HOSPITAL, 5, Lisle-street, Leicester-square, W.C. Afternoon Course in Dermatology. (Open to non-members.)—NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W. All-day Course in Cardiology. (Open to non-members.)—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W. Tues., 8.30 P.M., Mr. McNeill Love: Hernia. Thurs., 8.30 P.M., Mr. A. Lawrence Abel: The Surgery of the Sympathetic Nervous System.—ROYAL CHEST HOSPITAL, City-road, E.C. Sat. and Sun., Course in Diseases of the Heart and Lungs. (Open to non-members.)—(Courses arranged by the Fellowship are open only to Members.)
- LEEDS GENERAL INFIRMARY.**
TUESDAY, Jan. 14th.—3.30 P.M., Dr. MacAdam: Some Cases of Minor Invalidism.
- LEEDS PUBLIC DISPENSARY AND HOSPITAL.**
WEDNESDAY, Jan. 15th.—4 P.M., Mr. L. N. Pyrah: Injection Therapy in the Treatment of Hemorrhoids, Varicose Veins, and Hydrocele.
- UNIVERSITY OF DURHAM.**
SUNDAY, Jan. 19th.—10.30 A.M. (Newcastle General Hospital), Prof. T. Beattie: Medical Ward Visit.
- GLASGOW POST-GRADUATE ASSOCIATION.**
WEDNESDAY, Jan. 15th.—4.15 P.M. (Royal Maternity and Women's Hospital), Prof. James Hendry: Hemorrhage at the End of Pregnancy.

Appointments

- ATLEE, C. N., M.D. Durh., M.R.C.P. Lond., D.P.H., D.P.M., has been appointed Divisional Medical Officer to the London County Council.
- BALDWIN, E. J., M.B. Oxon., D.O.M.S., Hon. Ophthalmic Surgeon to the Essex County Hospital, Colchester.
- LAURENT, L. P. E., M.D., M.R.C.P. Lond., Medical Registrar at the West London Hospital.
- MITMAN, M., M.D., M.R.C.P. Lond., D.P.H., D.M.R.E., Medical Superintendent, Eastern Hospital.
- PEET, E. W., M.B. Durh., F.R.C.S. Eng., Bernhard Baron Research Student at the Ferens Institute of Otolaryngology at the Middlesex Hospital Medical School.
- SYKES, RUPERT, M.D., M.R.C.P. Lond., Resident Medical Officer at the Manchester Royal Infirmary.
- TALBOT, G. G., M.B. N.Z., F.R.C.S. Eng., Second Ophthalmic Surgeon to the Royal Northern Hospital, N.7.
- THOMPSON, H. R., M.B. Camb., F.R.C.S. Eng., Surgical First Assistant and Registrar at the London Hospital.
- WALTON, W. S., M.D. Durh., B.Hy., D.P.H., Medical Officer of Health and School Medical Officer for West Bromwich.
- WYATT, WALTER, M.B. Edin., L.D.S., D.P.M., Assistant School Medical Officer in Leeds.
- Princess Alice Memorial Hospital, Eastbourne.*—The following appointments are announced:—
HALL, E. WILSON, F.R.C.S. Edin., Hon. Surgeon;
SHERWOOD, G. D., M.B. Camb., Hon. Surgeon;
CROOK, A. H., M.Chir. Camb., F.R.C.S. Eng., Surgeon in Charge of Fracture Clinic;
ESTCOURT, H. G., M.B. Lond., F.R.C.S. Edin., Hon. Assistant Surgeon;
WILSON, T. H., M.B. Lond., F.R.C.S. Eng., Hon. Assistant Surgeon.

MEDICAL NEWS

University of Cambridge

The Rockefeller Foundation have made an annual grant of not more than £1200 for five years for research in cellular physiology at the Molteno Institute under the direction of Prof. Keilin.

The title of the degree of M.B. has been conferred on Mrs. M. H. D. Gunther.

University of London

At recent examinations the following candidates were successful:—

M.D.

Branch I. (Medicine).—W. H. P. Cant, Univ. of Birm.; P. C. L. Carrier, Charing Cross Hosp.; Iris M. Cullum, Royal Free Hosp.; M. E. Disney, London Hosp.; T. J. Evans, Univ. Coll. Cardiff, and Middlesex Hosp.; S. T. Falla, London Hosp.; H. F. M. Finzel, Univ. of Brist.; Clifford James, Middlesex Hosp.; D. E. V. Jones, King's Coll. Hosp.; H. M. R. Jones, Middlesex Hosp.; Herbert Kirman, King's Coll. Hosp.; Beatrice Lewis, Univ. Coll. Hosp.; R. J. G. Morrison, St. Bart.'s Hosp.; Ivor Whittington, St. George's Hosp.; J. C. Winteler, King's Coll. Hosp.; and Tamsin M. Wynter, Royal Free Hosp.

Branch II. (Pathology).—Ronald Hare, St. Mary's Hosp.; W. A. E. Karunaratne, Univ. Coll. Hosp.; D. M. Pryce, St. Mary's Hosp.; and R. S. Wale, King's Coll. Hosp.

Branch III. (Psychological Medicine).—H. A. Cooper, King's Coll. Hosp.

Branch IV. (Midwifery and Diseases of Women).—R. K. Bowes, Univ. of Liverp. and St. Thomas's Hosp.; J. O. F. Davies, Middlesex Hosp.; Mary Evans, King's Coll. Hosp.; and Margaret M. White and Honor E. C. Wilkins, Royal Free Hosp.

Branch V. (Hygiene).—D. M. Connan, King's Coll. Hosp. and Westminster Hosp.; David Erskine, Guy's Hosp. and London School of Hygiene and Tropical Medicine; J. T. R. Lewis, Middlesex Hosp.; and F. J. G. Lishman, Univ. Coll. Hosp. and London School of Hygiene and Tropical Medicine.

University of Birmingham

At recent examinations the following candidates were successful:—

FINAL EXAMINATION FOR M.B., B.S.

E. M. Barker, Dorothy M. Braddock, N. R. Chan-Pong, A. W. F. Craig, F. J. Fowler, R. J. Ingham, E. E. K. Kilvert, B. A. Singer, Aileen M. Sutcliffe, and L. K. Thompson.

B.D.S.

C. G. Heils.

Royal College of Surgeons of England

The following lectures will be given at the college on Mondays, Wednesdays, and Fridays from Jan. 17th to Feb. 21st: Jan. 17th, Mr. A. F. MacCallan, the surgery and pathology of trachomatous conjunctivitis; Jan. 20th, Dr. E. W. Twining, a radiological study of the third ventricle; Jan. 22nd, Mr. Arthur Bulleid, the assessment of dental sepsis as a factor affecting medical and surgical procedures; Jan. 24th, Mr. John Gilmour, adolescent deformities of the acetabulum; Jan. 27th, Mr. E. P. Stibbe, the anatomy and surgery of the subtentorial angle; Jan. 29th, Mr. R. T. Payne, pyogenic infections of the parotid; Jan. 31st, Mr. G. A. Mason, extirpation of the lung; Feb. 3rd, Mr. A. M. Boyd, the investigation of peripheral vascular disease; Feb. 5th, Mr. H. Osmonde Clarke, injuries of the carpal bones; Feb. 7th, Mr. F. H. Bentley, wound healing in vitro and the interrelation of epithelial and fibrous tissue growth; Feb. 10th, Mr. G. C. Knight, intestinal strangulation; and Feb. 12th, Mr. G. F. Rowbotham, a series of tumours of the skull. On Feb. 17th, 19th, and 21st Dr. John Beattie will give three lectures on temperature regulation. All the lectures will take place at 5 P.M.

Order of St. John of Jerusalem

The following promotions in and appointments to the Venerable Order of the Hospital of St. John of Jerusalem have been sanctioned by the King:—

As Knight of Grace.—Lieut.-Colonel R. E. Wodehouse, O.B.E., M.D.

As Commander.—James Cairns, O.B.E., M.B., and Lieut.-General Sir James Andrew Hartigan, K.C.B., C.M.G., D.S.O., M.B.

As Officer.—Dr. N. M. Goodman, Major C. G. H. Morse, M.R.C.S.; Major R. F. Walker, M.C., M.B., R.A.M.C.; Dr. A. Tetreault, Lieut.-Colonel J. N. Gunn, D.S.O., M.D., M.R.C.S.; and Mrs. Constance E. M. Berridge, M.B.

Royal Society of Arts

On Wednesday, Jan. 15th, at 8 P.M., Mr. L. H. Lampitt, D.Sc., chairman of the food group of the Society of Chemical Industry, will speak on Food and the World.

Guild of Hospital Librarians

The first international meeting of this guild will be held in Paris from May 8th to 11th. The speakers will include Dr. René Sand, Madame Getting, Mademoiselle Oddon, Mr. C. E. A. Bedwell, Mrs. M. E. Roberts, and Mr. A. D. Power. The hon. secretary may be addressed at 48, Queen's-gardens, London, W. 2.

Hunterian Society

The Hunterian lecture of this society will be delivered at the Mansion House, London, E.C., at 9 P.M. on Monday, Jan. 20th, by Dr. Sven Ingvar, professor of medicine at the University of Lund, Sweden. He will speak on the physical basis of psychoneurosis.

The annual dinner of the society will be held on Thursday, Feb. 13th, at the May Fair Hotel.

Post-graduate Work in Newcastle

Under the auspices of the University of Durham classes will meet at the Babies' Hospital and Royal Victoria Infirmary, Newcastle, during the months of January, February, and March on Thursday afternoons. Till March 22nd there will be lecture demonstrations in medicine and surgery every Sunday at 10.30 A.M. Further particulars may be had from the Registrar, College of Medicine, Newcastle-upon-Tyne.

The late Dr. Haydn Brown

The death occurred on Jan. 3rd of Dr. Haydn Brown at his house in Bedford-square. He came prominently before the public as on two occasions the General Medical Council felt constrained to remove his name from the Medical Register for ethical reasons, which led to journalistic comment. He wrote profusely on many subjects which, generally speaking, fall within the province of the neurologist, but he was unable to convince his medical colleagues of the scientific soundness of his theories, in which he himself was, however, an implicit believer.

German Society for Internal Medicine

The Deutsche Gesellschaft für Innere Medizin is holding its forty-eighth meeting from March 23rd to 26th at Wiesbaden under the presidency of Prof. Schwenkenbecher of Marburg. A joint meeting will be held with the Reichsarbeitsgemeinschaft für eine neue deutsche Heilkunde when the internal treatment of thyrotoxicosis will be discussed. Other subjects for discussion will be the electrocardiographic diagnosis of myocarditis and diseases of the lung caused by inhalation of dust. The last two sessions will be devoted to joint meetings with the Deutsche Röntgengesellschaft when the subjects of discussion will be inflammatory diseases of the large intestine, the diagnosis of cavities, and the radiotherapy of malignant tumours of the internal organs. Dr. A. Géronne, of Wiesbaden, is the secretary of the congress.

The Medical Society of London

The second half of the 1935-36 session of this society will open on Jan. 13th with a pathological meeting. On Jan. 27th Mr. Zachary Cope will open a discussion on the treatment of acute appendicitis, and other discussions and their openers will be: Mr. C. S. Lane-Roberts on the treatment of sterility (Feb. 10th), Lord Horder on the aetiology and treatment of *B. coli* infections of the urinary tract (Feb. 24th), Mr. A. Dickson Wright on phlebitis and its treatment (March 9th), and Prof. G. Grey Turner on surgery of the oesophagus (March 23rd). The Lettsoman lectures will be given on Feb. 10th and 26th and March 2nd by Dr. Philip Manson-Bahr, who has chosen as his subject the differential diagnosis of diseases of the colon (dysentery and colitis) and their complications, with special reference to treatment. Sir James Walton will deliver the annual oration on May 11th, when he will speak on carcinoma of the stomach. The annual dinner of the society will be held at Claridge's on Thursday, Feb. 27th.

Pharmaceutical Society of Great Britain

On Tuesday, Jan. 14th, Mr. H. Berry will give a lecture on sterilisation technique. The meeting will be held at 8.30 p.m. at the house of the society, 17, Bloomsbury-square, London, W.C.

Tenth British Congress of Obstetrics and Gynaecology

This Congress will be held at Belfast from April 1st to 3rd under the presidency of Prof. R. J. Johnstone. One of the chief subjects of discussion will be the conservative treatment (operative or otherwise) of pathological conditions of the ovaries, tubes, and uterus, and there will be communications from several sources on radiotherapy of uterine diseases, on the use of sex hormones in gynaecology, and on sepsis and other complications of pregnancy and labour. The secretaries are Mr. C. H. G. Macafee and Dr. F. M. B. Allen, and the address of the former is 18, University-square, Belfast.

A Drowning Tragedy

Further details are to hand of the death of Dr. A. B. Aitken, which occurred on Dec. 8th at Lagos, as a result of a drowning accident. Dr. Aitken, who received his medical education at the University of Glasgow and the London Hospital, graduated as M.B., Ch.B. Glasg. in 1905 and took the diploma of F.R.C.S. Eng. in 1909. He served as house surgeon to the Royal Hospital for Sick Children, Glasgow, and at the outbreak of war, with the rank of temporary captain, was attached to the R.A.M.C. as a surgical specialist. Later he became consulting surgeon to the African hospital at Lagos and established a reputation throughout the whole district as a surgeon. He was out swimming with a party at Lagos when he got into difficulties. A brave attempt to rescue him was made by Sir Walter Johnson, director of medical and sanitary services in Nigeria, who himself was only saved by means of a rope of towels knotted together by other members of the party.

B.M.A. Scholarships and Grants in Aid of Research

The Council of the British Medical Association is prepared to receive applications for research scholarships and grants for the assistance of research in connexion with disease.

Scholarships.—An Ernest Hart Memorial Scholarship, value £200 per annum, a Walter Dixon Scholarship, value £200 per annum, and three Research Scholarships, each of the value of £150 per annum. These scholarships are given to candidates whom the Science Committee of the Association recommends as qualified to undertake research in any subject (including State medicine) relating to the causation, prevention, or treatment of disease. Each scholarship is tenable for one year, commencing on Oct. 1st, 1936. A scholar may be reappointed for not more than two additional terms and is not necessarily required to devote whole time to the work, but may hold a junior appointment at a university, medical school, or hospital, provided the duties of such appointment do not interfere with the work as a scholar.

Grants for the assistance of research into the causation, treatment, or prevention of disease will be made to applicants who propose as subjects of investigation problems directly related to practical medicine.

In making awards preference will be given to members of the medical profession, and applications must be made not later than May 9th on the prescribed form, a copy of which will be supplied on application to the medical secretary of the Association, B.M.A. House, Tavistock-square, London, W.C.1. Applicants are required to furnish the names of three referees who are competent to speak as to their capacity for the research contemplated.

Vacancies

For further information refer to the advertisement columns

Aberdeen City District Mental Hospital.—Jun. Asst. M.O. £300.
Bury Surgical Hospital.—Res. Surg. O. £350.
Bedford County Hospital.—Second H.S. At rate of £150.
Birmingham City Mental Hospital.—Jun. Asst. M.O. £350.
Birmingham and Midland Eye Hospital.—Res. Surg. O. £200.
Birmingham, Selly Oak Hospital.—Jun. M.O.'s. Each at rate of £200.
Birmingham United Hospital.—Bacteriologist and Clin. Pathologist. £500.
Bolingbroke Hospital, Wandsworth Common, S.W.—H.P. At rate of £120.

Boole General Hospital.—H.P., two H.S.'s. Also Cas. O. Each at rate of £150.
Brighton, Sussex Eye Hospital.—Hon. Asst. Surgeon.
Bristol Royal Infirmary.—H.P.'s, H.S.'s, &c. Each at rate of £80. Also Sen. Obstet. Surg. At rate of £100.
British Postgraduate Medical School, Ducane-road, W.—H.P. Carshalton, Surrey, *Queen Mary's Hospital for Children.*—Asst. M.O. £250.
Charing Cross Hospital, W.C.—Hon. Anaesthetist.
Chelsea Hospital for Women, Arthur-street, S.W.—Pathologist. £40.
Colchester, Essex County Hospital.—Asst. H.S. £120.
Colindale Hospital, Colindale, N.W.—Asst. M.O. £350.
County Hall, Westminster Bridge, S.E.—Asst. M.O. £600. Also Asst. M.O.'s for School Medical Work. 30s. a session.
Coventry and Warwickshire Hospital.—H.S. to Aural and Ophth. Depts. At rate of £125.
Croydon, Mayday Hospital.—Jun. Res. Asst. M.O. £300.
Doncaster Royal Infirmary.—H.S. £175.
Doncaster County Council.—Asst. County M.O. £500.
Eastern Fever Hospital, Homerton-grove, E.—Asst. M.O. £250.
East Riding Mental Hospital, Beverley.—Jun. Asst. M.O. £250.
Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Clin. Asst. to Far, Nose, and Throat Dept. Also Asst. Radiologist. £100.
Evelina Hospital for Sick Children, Southwark, S.E.—Dental Surgeon. 50 guineas.
Glasgow Victoria Infirmary.—Asst. Radiologist. Also two additional Visiting Anaesthetists. Each £400.
Grimby and District Hospital.—Sen. H.S. £200. Also Jun. H.S. and H.P. Each £150.
Halifax General Hospital.—Jun. Res. M.O. £250.
Hampstead General and N.W. London Hospital, Haverstock Hill, N.W.—H.P. At rate of £100.
Hertford County Hospital.—H.P. At rate of £150.
Huddersfield County Borough.—Asst. School M.O. £500.
Ipswich, East Suffolk and Ipswich Hospital.—H.P. £144.
Ipsworth, West Middlesex County Hospital.—Res. Anaesthetist. £400. Also Cas. M.O. £350.
Kettering and District General Hospital.—Second Res. M.O. At rate of £125.
Leeds General Infirmary.—Res. Aural Officer. £149.
Liverpool and District Hospital for Diseases of Heart.—H.P. At rate of £100.
Liverpool, Royal Children's Hospital.—Med. Reg. and Tutor. £50.
Liverpool, Stanley Hospital.—H.S., H.P., and Gynaecological H.S. Each at rate of £100.
L.C.C. Group Laboratory, Archway Hospital, Archway-road, N.—Asst. Pathologist. £650.
London County Council.—Asst. M.O.'s for Mental Hospital. Each £170.
London Homoeopathic Hospital, Great Ormond-street, W.C.—Asst. Physician for Diseases of Women.
London Hospital, E.—Asst. in X Ray Dept. £100. Also Hon. Asst. Surgeon.
London School of Clinical Medicine, Dreadnought Hospital, Greenwich, S.E.—Jun. Pathologist. £400.
Manchester, Ancoats Hospital.—Two H.S.'s. Each at rate of £100. Also Med. Reg. £50.
Manchester Victoria Memorial Jewish Hospital, Cheetham.—Res. H.S. £150.
Marie Curie Hospital, 2, Fitzjohns-avenue, N.W.—Res. M.O. At rate of £100.
Metropolitan Hospital, Kingsland-road, E.—Res. Cas. O. £100.
National Dental Hospital.—Hon. Asst. Anaesthetist.
Newcastle-upon-Tyne, Barrasford Sanatorium.—Res. Med. Asst. £250.
Newcastle-upon-Tyne, City Hospital for Infectious Diseases.—Res. Med. Asst. £350.
Newcastle-upon-Tyne, Hospital for Sick Children.—Res. Surg. O. £250. Also H.P. and H.S. Each at rate of £100.
Nottingham General Hospital.—H.S. At rate of £150.
Oswestry, Robert Jones and Agnes Hunt Orthopaedic Hospital.—H.S. At rate of £200.
Pinewood Sanatorium, Wokingham, Berks.—Asst. M.O. £250.
Plymouth, Mount Gold Orthopaedic and Tuberculosis Hospital.—Asst. Res. M.O. £350.
Preston, Biddulph Grange Orthopaedic Hospital.—Sen. H.S. At rate of £250.
Putney Hospital, Lower Common, S.W.—Jun. M.O. At rate of £100.
Queen's Hospital for Children, Hackney-road, E.—Three Anaesthetists. One guinea per attendance.
Reading, Royal Berkshire Hospital.—Cas. O. At rate of £125.
Royal Eye Hospital, St. George's-circus, Southwark, S.E.—Hon. Asst. Surgeon.
Royal Masonic Hospital, Ravenscourt Park, W.—Surgeon.
St. Bartholomew's Hospital, E.C.—Asst. Physician. Also Asst. Physician and Asst. Director to Medical Professorial Clinic.
St. Mary's Hospital, W.—Cas. H.S. At rate of £100.
Salford Royal Hospital.—Orthopaedic Reg. £100.
Smethwick, St. Chad's Hospital.—Res. Obstet. Officer. £350. Also Jun. Res. M.O. At rate of £150.
Southampton, Borough General Hospital.—Jun. Res. M.O. £200.
South London Hospital for Women, Clapham Common, S.W.—Out-patient M.O. £100.
Stockport Infirmary.—Res. Surg. O. £250.
Stoke-on-Trent, Longton Hospital.—H.S. £160.
Swindon and North Wills Victoria Hospital.—Second Res. M.O. £125.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—Cas. O. At rate of £200. Also H.P. and H.S. Each at rate of £100.
West End Hospital for Nervous Diseases, Gloucester-gate, N.W.—Res. H.P. £125.
Westminster Hospital, Broad Sanctuary, S.W.—Asst. Obstet. Surgeon.
Worcester Royal Infirmary.—Jun. H.S. £120.
Workson, Victoria Hospital.—Sen. and Jun. Resident. At rate of £150 and £120 respectively.

NOTES, COMMENTS, AND ABSTRACTS

SCHOOL PRESSURE IN WORK AND PLAY

THAT the stress of modern education and examinations in schools is shown by a loss of weight during term, the weight being made up in holidays. was the contention of Dr. G. O. Barber, M.O., of Felsted, who opened a discussion at a meeting of the Society of Medical Officers of Schools, held at University College on Jan. 3rd. The fact that this rhythm occurred in day- as well as in boarding-schools showed that it was not due to school food. It was, moreover, general experience that a boy admitted to the sanatorium with some minor physical injury slept solidly, waking only for food, for the first 24 hours. Similarly children slept a lot at the beginning of the holidays before they came to take an interest in hobbies or games. The three ways of dealing with the problem were: (1) distribution of the strain by reducing work periods and providing a midday pause of half an hour when the child could do exactly what it liked; (2) free time—rightly used (at Felsted the hobbies and clubs were housed in a big country house, with a warden to help boys out of difficulties, where each could follow his bent); (3) morning and evening chapel which provided ten minutes of detachment at each end of the day.—Dr. Alice Sanderson Clow (Cheltenham), who followed, held that children needed protection against their own energies rather than stimulation. Great responsibility rested on the parent and head of a boarding-house in detecting the early signs of fatigue. By the time the doctor was consulted the symptoms were anxiety, diminished concentration, stooping, loss of appetite, and broken sleep, and the only remedy was prolonged absence from school. A brain once impaired by prolonged fatigue rarely, if ever, recovered completely. The greatest feature in modern strain seemed to be the external examination taken too young. The morning session should be from 9 to 12.40, with 5-minute intervals of complete relaxation between the 40-minute lessons and a 30-minute break in the middle of the morning. Children found essay writing a great strain, and the homework set was usually too long for all but the brightest. Some homework was good in that it could be done in the evening, allowing the child to get out in the afternoon sun. A tired child sought rest rather than play, and might be overdone by organised games, especially with the element of competition. A little girl of 12 who had recently gone to her first boarding-school had said, "Oh, everything is lovely—but there's no time to play." "But don't you have games?" "Oh, yes, we have lots of games and they're glorious. But they're not play." Dr. Clow contrasted the white limbs of school-children on the beach early in the holidays with the bronze of their parents and baby brothers; school-children were often kept in high collars, in order to display the school tie, and in gloves and long black stockings which were unhygienic from every point of view.—Mr. A. J. R. Roberts (head of Mill Hill junior school) had known in many years' experience only one breakdown, which had taken place during holiday time. The régime of his school included most of the desiderata mentioned. Boys who spent themselves in nervous energy must be given a day in bed now and then.—Mr. Lee-Browne (head master of Rendcomb College) also outlined his time-table; teaching periods had been reduced to 28 and preparation to 7½ hours for boys up to 15 and 10½ hours over that age. These hours included music, drawing, and manual work; and there had been no falling off in scholastic success as a result. His boys got about 20 hours of spare time a week, with 8 on Sunday, on which day 1 hour must be spent in compulsory quiet. Value had been obtained from a brief exercise before breakfast followed by a cold bath. Recently they had instituted, with great success, one completely free afternoon a week when boys could do exactly what they liked—work or play. There was a very real problem of holiday pressure—the pressure of the car-

the cinema, or even the organised camp. The time for character training had been squeezed almost out by new subjects in the curriculum. If the number of teaching hours could not be reduced the period of school life would have to be lengthened.—Dr. Jessie White thought strain would be greatly lessened if children were allowed to move about freely while being taught, instead of being obliged to sit for long periods in cramped positions.

THE SELECTION OF AN ANÆSTHETIC

"Who pays the piper . . ."

BUT the patient would generally be very ill served if he were allowed to call the tune. The wise doctor will not categorically refuse his right to call it, but while appearing to concede the request he will do what he knows to be best for his patient. A few days ago a hospital visitor handed on to the executive committee a complaint by patients who had been given a local anæsthetic as a preparation for a major operation. Some persons, she said, had come to hospital expecting to have a general anæsthetic and had been shocked to find themselves conscious on the operating table. It may safely be assumed that the local anæsthetic was preferred for some good reason. There are occasions when, in some form or another, it is so much the safer method to adopt that the surgeon has no choice in the matter. There are others when the advantage is less decisive and when the patient may reasonably be given his choice. Perhaps when the inquiry suggested at the Manchester Medical Society (see p. 89) has been made there may be less room for such choice. But to put the pros and cons before the patient would generally be to ask him to answer a question the full bearings of which he cannot possibly realise. When as a result of previous experiences of his own he holds definite views as to the anæsthetic which suits him the anæsthetist will weigh these before he makes up his own mind. What anæsthetist has not met the patient who "cannot take ether; they tried to give it to me but it's no good"? And what anæsthetist has not in those circumstances started the administration with something else and then gone on to give ether without a hitch? The same thing is true of almost any anæsthetic. But every anæsthetist knows the importance of a quiet mind in the subject for operation; it is half the battle that the patient should believe from the start that what is being done is suitable to him and in accordance with his desire—if he has expressed one.

THE KEEP FIT ADVENTURE IN SUNDERLAND

THE development of the Keep Fit movement in Sunderland ought to dispel any doubts whether youths and men and girls and women of this country are ready to respond to opportunities of organised physical training when they are offered by an organiser of inspiring zeal. Chapter II. of the report of the C.M.O. of the Board of Education, to which reference has already been made, relates the history of the movement. To the very first class, held in the winter of 1929, there came 127 girls, and on the evening of May 8th, 1935, no fewer than 1450 women and girls took the field in a mass demonstration. A ten-fold increase in six years clearly proves the case for such an "adventure." Throughout the 25 weeks of that first winter season, two classes were held, one for girls under 16 years of age and one for older women. The organiser took both these classes herself, but as the numbers increased it was found necessary to appeal for voluntary leaders to take extra classes. In response to this appeal, 17 elementary school teachers and three trained gymnasts came forward to offer their help.

From 1930 onwards demonstrations have been given in various parts of the counties of Northumberland and Durham, and it has been found that this is

one of the most effective means of spreading the work and of arousing enthusiasm. Through the coöperation of the chief education officer and of headmasters and mistresses of schools with good halls, arrangements were made whereby halls became available to the movement at the cost of paying each caretaker the fee of 1s. per class. In 1930 there were nine classes running in different parts of the town, with an average attendance of 500 a week, but by the end of 1934 there were 18 classes, with an average attendance of 1000. At the beginning all classes were for anybody and everybody, but soon there sprang into being one special class for mothers only, provided with a nursery, and two classes for women over 40. The leaders are now sufficiently trained to give courses of lessons.

As far back as 1931 Sunderland leaders of classes were taking classes outside the Sunderland area. Then organisers in Northumberland and in Newcastle began to train leaders, and so the work spread to various districts, each district supporting itself. Sunderland is very proud of its "keep fit" adventure, and the officers of the local education authority have had the reward of seeing those for whom they have worked reaping the full benefit of their efforts. The movement is spreading to Huddersfield, Halifax, and other northern towns.

THE "REALITY" OF PAIN AND DISEASE

Mr. CHARLES W. J. TENNANT, district manager of the Christian Science Committees on Publication for Great Britain and Ireland, writes: In his lecture on Medicine and Faith published in your issue of Dec. 28th, 1935, Dr. Louis Leopoldt, quoting from the fifth chapter of the Epistle of St. James, infers that pain and disease must be regarded as realities, "and not, as the Christian Scientists would have us believe, as mere figments in a perfect world." To a Christian Scientist "reality" means that which is "spiritual, harmonious, immutable, immortal, divine, eternal" ("Science and Health with Key to the Scriptures," by Mary Baker Eddy, p. 335). If disease were a reality in the above sense, it could never be cured. God is the creator of all that is real, eternal, immutable, and immortal. Therefore sin, disease, and death, which do not proceed from God, are unreal, and can only be the erroneous conceptions of a false material sense. Christian Scientists, in the measure of their spiritual understanding, are daily proving the unreality of evil by healing the sick and reforming the sinner through spiritual means alone in fulfilment of our Master's command.

NEW PREPARATIONS

"KALDROX" ABSORBENT COMPOUND is described as a palatable emulsoid of colloidal kaolin and aluminium hydroxide gel, the formula being kaolin 20, aluminium hydroxide 2.5, aromatics 0.008, aqua destill. to 100. It is used to remove excess acid from the stomach by adsorption and provide a protective covering for irritated mucous membrane, thus relieving the pain or discomfort often associated with peptic ulceration; it is also recommended for diarrhoea and conditions designated "colitis" or "unstable bowel." The makers are Petrolagar Laboratories Ltd., Braydon-road, London, N.16.

BELLERGAL.—Each tablet contains 0.001 g. of Bellafoline (laevorotatory alkaloids of belladonna), 0.0003 g. of Femergin (ergotamine tartrate), and 0.02 g. of phenobarbital. It is designed to overcome excessive autonomic nervous tone; the belladonna restrains over-activity of the sympathetic, while the ergotamine inhibits the parasympathetic—the two forms of hypertonus being often associated though one of them may predominate. Experiments are held to show that the individual actions of belladonna and ergotamine are not impaired by mixing them in Bellerгал and that the central sedative action of phenobarbital is increased. The remedy is prepared by Sandoz Products (134, Wigmore-street, London, W. 1), and is recommended especially for the prevention of migraine and asthma, and the treatment of

Graves's disease, urticaria, pruritus, night-sweats, and functional nervous disorders. The dose proposed is 3-4 tablets daily, or sometimes more.

"TABLOID" BLAUD PILL AND COPPER.—It has been suggested that the therapeutic action of iron is enhanced by the addition of minute quantities of copper. Quoting work by M. S. Rose (1932), Prof. L. J. Witts stated in our last issue that "in experimental animals iron can be absorbed and stored in the liver but cannot be converted into hæmoglobin unless copper is also present." How far a physiological deficiency of copper can occur in the human beings is open to question, but the use of this metal in conjunction with iron may perhaps be effective in some cases where iron alone has failed. For the convenience of those physicians who favour its administration Messrs. Burroughs Wellcome and Co. (Snow-hill Buildings, London, E.C. 1) are now issuing Bland Pill (pil. ferri carb. B.P.) and Copper in the form of Tabloids. Each contains 10 grains of the pill and 1/100 grain of copper sulphate.

APONDON "DIWAG" is a preparation of thyroid recommended for use in obesity. The objection to using thyroid by itself is that it gives rise to symptoms such as tachycardia and restlessness, and in Apondon this obstacle is overcome, it is claimed, by the addition of a sympathetic depressant, Ergocholin "Diwag," made by the same firm, Dr. Joachim Wiernik A.-G., Berlin-Waidmannslust. Each pill includes 5.25 mg. of the Ergocholin and 114 mg. of standardised thyroid gland (= 0.5 mg. iodine) and the suggested dose is 1-2 pills daily at first and 2-4 later. The preparation is distributed in this country by Messrs. Coates and Cooper Ltd. (94, Clerkenwell-road, London, E.C. 1).

We have received from the MARMITE Food Extract Company a booklet which sets out clearly under three main headings evidence of the potency of the product in the vitamin-B complex, of its efficacy in the treatment of certain anæmias, and of its value in tropical medicine. Some 70 recent references to medical literature are quoted in support of the claims made, and a dosage table and details as to administration are appended.

Births, Marriages, and Deaths

BIRTHS

- ANDERSON.—On Jan. 3rd, to Margaret (née Hutton), wife of Dr. E. W. Anderson, a son.
 BULL.—On Jan. 1st, at Devonshire-place, the wife of Dr. Cecil Bull, of a daughter.
 DICKS.—On Jan. 6th, at Blackheath, the wife of Henry V. Dicks, M.D. Camb., of a son.
 MACLAY.—On Jan. 4th, at Kensington-square, W., the wife of the Hon. W. S. Maclay, M.D. Camb., of a daughter.

MARRIAGES

- OWEN—CHIOZZA MONEY.—On Dec. 31st, 1935, at Caxton Hall, Thomas Owens, M.R.C.S. Eng. (Camb. and St. Bart.'s), to Gwendolen Doris, only child of Sir Leo and Lady Chiozza Money, of Bramley, Surrey.
 REWCASTLE-WOODS—LESTER.—On Nov. 30th, 1935, at Hong-kong, Dr. T. G. Rewcastle-Woods to Bertha Iris Lester. (Address, Methodist Mission, Hankow, Hupeh, China.)

DEATHS

- BROWN.—On Jan. 3rd, at Bedford-square, W.C., Haydn Brown, L.R.C.S. Edin.
 COULDBREY.—On Jan. 5th, at Scunthorpe, Lincs, Thomas Reginald Couldrey, M.R.C.S. Eng.
 GIBSON.—On Dec. 27th, 1935, at Paradis, Grange, Guernsey, Edmund Valentine Gibson, M.D.
 GRAY.—On Jan. 4th, at Glasgow, Albert Alexander Gray, M.D. Glasg.
 MORRIS.—On Dec. 31st, 1935, at Caerleon, Monmouthshire, Lieut.-Col. William Albert Morris, L.R.C.P. Edin., R.A.M.C. (retd.), in his 79th year.
 ORLEBAR.—On Jan. 2nd, at Hove, of acute pneumonia, Jeffery Alexander Amherst Orlebar, M.B. Camb.
 READ.—On Jan. 2nd, Mabyn Read, M.D. Camb., D.P.H., Medical Officer of Health for Worcester, 1891 to 1929, aged 81.
 WHITE.—On Jan. 5th, at St. Bartholomew's Hospital, Rochester, Clement John Goodhugh White, M.B. Camb., aged 27 years.
 N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

ADDRESSES AND ORIGINAL ARTICLES

DIABETES MELLITUS

ITS DIFFERENTIATION INTO INSULIN-SENSITIVE AND INSULIN-INSENSITIVE TYPES*

By H. P. HIMSWORTH, M.D., M.R.C.P. Lond.

DEPUTY DIRECTOR OF THE MEDICAL UNIT, UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL, LONDON

In previous publications¹⁻⁵ it has been shown that the efficiency with which insulin acts in the body is governed by an unknown factor or condition which renders the body sensitive both to injected and pancreatic insulin. When this sensitising factor is limited the efficiency with which each unit of insulin depresses the blood-sugar is decreased, and when it is abundant the efficiency of each unit is correspondingly increased. It can easily be seen that if this sensitising factor is limited below a certain degree, then the insulin in the body will be relatively powerless and the symptoms and signs of hypo-insulinism, clinically recognisable as diabetes mellitus, will appear. This consideration led me to suggest^{4, 5} that a type of diabetes mellitus might exist which was due, not to lack of insulin, but rather to lack of this sensitising factor. An investigation of cases of diabetic patients from this point of view was therefore commenced.

At first sight the simplest method of testing this hypothesis would appear to be by comparing in different diabetic subjects the rate and extent of fall of the blood-sugar after a standard dose of insulin. Such comparison of insulin depression curves from diabetic patients is, however, impossible. Insulin depression curves are only comparable when obtained from one and the same subject and, even then, only if the initial blood-sugar values of the different curves are within a few mg. per 100 c.cm. of the same level.³ A new test was therefore sought and found in the application of an observation previously made on animals.³ If glucose and insulin are given simultaneously to a normal animal, then the extent to which the injected insulin suppresses the hyperglycæmia, consequent upon the administration of glucose, is determined by the sensitivity of the animal to insulin. This test has two great advantages over the insulin depression curve. Greater changes of the blood-sugar occur, and therefore minor variations consequent upon differences of the fasting blood-sugar level of the order of 50 mg. per 100 c.cm., may be disregarded; the effect of insulin in suppressing hyperglycæmia can be gauged by comparing the blood-sugar curve resulting from glucose alone with the curve resulting from glucose plus insulin.

THE TEST

The patient receives no food or insulin after supper the previous evening and the test is carried out next morning. Blood-sugar estimations are performed on capillary blood. Three resting samples are taken. The patient is given the appropriate dose of insulin intravenously and immediately afterwards the appropriate dose of glucose to drink. A blood sample is taken 5 minutes after the insulin injection, the next at 10 minutes, and subsequent samples at intervals of 10 minutes until the hour is reached, and then two more samples at 15 minute intervals. The test is thus completed in 90 minutes.

* Part of this work was done during the tenure of a Beit memorial research fellowship.

The doses of insulin and of glucose can conveniently be based on the surface area of the patient. The patient's height and weight being known this is determined from the appropriate nomogram.⁶ In our tests 30 grammes of glucose and 5 units of insulin per square metre of body surface were allowed. The glucose was given dissolved in half a pint of cold water and flavoured with citric acid and essence of lemon; the insulin used, for which I am indebted to Dr. J. W. Trevan of the Wellcome Physiological Research Laboratories, was a sterile solution of crystalline insulin assayed at 10 units per c.cm.

Various precautions are necessary to obtain satisfactory results. Firstly, the test must not be carried out if the patient shows signs of nausea or faintness. In these cases absorption from the stomach is delayed and a fallacious result obtained. Secondly, if it is desired to compare a series of curves, the patients must all be receiving diets containing approximately the same amount of carbohydrate, as I have previously shown that the insulin sensitivity of a normal subject is determined by the amount of carbohydrate utilised.⁵ In the case of diabetics care should be taken that sugar is not being excreted in the urine in such amounts as to reduce materially the carbohydrate supply of the body. Thirdly, conditions of exercise will very probably affect the test. This factor did not apply in my cases, as all the subjects were hospital in-patients and advantage was taken of this fact to perform the test under "basal conditions."

RESULTS

The work had not proceeded far before it became clear that by means of this test diabetics can be differentiated into two types: those in whom the injected insulin produces an immediate suppression of the hyperglycæmia which normally follows ingestion of glucose alone; and those in whom the insulin has little or no effect in suppressing this hyperglycæmia. In Fig. 1 a typical curve from each type of patient is shown. In patient I. the insulin has had little effect, whilst in patient II. not only has the hyperglycæmia been suppressed but an actual depression of the blood-sugar level has been produced. Patient I. is insulin-insensitive; patient II. is insulin-sensitive. Point is lent to these results when it is noted that patient I. passed only small amounts of sugar when receiving 20 units of insulin a day, whilst patient II. required 95 units of insulin a day to keep her sugar-free. Reference to the curves marked "capillary blood" in Fig. 2 show that in patient III., who is insulin-insensitive, there is very little difference between the curve after glucose alone (III. A) and the curve after giving the same dose of glucose and in addition insulin (III. B), whilst the capillary blood curves for the insulin-sensitive patient IV. differ widely when in one case only glucose is administered (IV. A), and in the second glucose and insulin (IV. B).

It may here be noted that the curve in healthy subjects approximates to that of the insulin-sensitive diabetics.² The curve obtained in this type of patient (II. and IV.) thus appears capable of easy explanation as being the result of normal insulin action.

The curve in the insulin-insensitive patients (I. and III.) is more difficult to explain. Three distinct possibilities offer themselves: (i) the liver may be pouring so much sugar into the blood that the effect of the injected insulin is swamped; (ii) the liver may be incapable of storing the ingested sugar; (iii) the characteristic action of insulin in promoting

storage of blood-sugar in the peripheral tissues may be unable to manifest itself. The first two possibilities involve the portal system, the third the peripheral tissues. If now it is possible to compare the removal of sugar by the peripheral tissues, firstly, when glucose is given alone, and secondly, when glucose is given along with insulin, the site of the functional derangement can be localised either to the periphery or to the portal system. This can be done by measuring the sugar content of the blood entering a limb and the sugar content of the blood leaving the limb.

I have shown that capillary blood taken from the warm ear has approximately the same sugar content as arterial blood, and also that venous blood specimens taken under identical conditions from the same half inch of vein in all tests on the same subject give a reliable if only relative indication of the sugar content of the blood leaving the limb.² By performing simultaneous curves on capillary and venous blood (A.V. curves) after ingestion of glucose and after glucose and insulin, and comparing the size of the capillary venous blood difference (A.V. difference), a rough estimation can be made of the extent to which insulin promotes peripheral storage in a particular case. In the normal subject the giving of insulin along with glucose results in a tremendous increase in the A.V. difference as compared with the increase of A.V. difference after glucose alone.² This increase is so great as to be quite outside the limits

of experimental error. A.V. curves were, therefore, performed on both insulin-sensitive and insulin-insensitive diabetics. The results are shown in Fig. 2.

In the insulin-sensitive patient IV. insulin had the normal effect of greatly augmenting the A.V. difference after glucose. Up to 60 minutes the area enclosed between the capillary and venous blood-sugar curves of curve IV.B, as compared with curve IV.A, increased by 120 per cent.

In the insulin-insensitive patient the effect is quite different. On comparing curve III.A (glucose alone) with curve III.B (glucose

+ insulin), it will be seen that the insulin has resulted in little or no increase of A.V. difference. By actual measurement of the areas enclosed between the capillary and venous blood-sugar curves the increase is found to be the negligible figure of 9 per cent.

It may thus be seen that, in the insulin-insensitive diabetic, insulin is unable to exert its characteristic action of effecting the transference of sugar from the blood to the peripheral tissues; that even if the insulin-insensitive patient possessed a normal supply of pancreatic insulin such insulin would be unable to act efficiently and the patient would be diabetic. On the other hand, it is seen that in the insulin-sensitive diabetic insulin is able to act, that the giving of this substance produces a normal reaction, and that, therefore, if these diabetics had a greater supply of pancreatic insulin, they would show no signs of diabetes mellitus.

It therefore appears that in insulin-sensitive diabetics the disease is due to deficiency of insulin, whilst in insulin-insensitive patients diabetes mellitus results, not from lack of insulin, but from lack of an unknown factor which renders the body sensitive to insulin.

CLINICAL OBSERVATIONS

Sufficient data have not yet been accumulated to permit a precise correlation between the clinical findings and the type of diabetes mellitus as revealed by the glucose-insulin test. But enough observations have been made to allow certain tentative opinions to be expressed.

A general relationship appears to exist between the type of onset of the disease and the type of diabetes. The onset in insulin-sensitive patients is as a rule acute; the onset in insulin-insensitive patients is insidious. For example, in the insulin-sensitive patient II. (a girl aged 21), the diabetes mellitus appeared with intense symptoms, and within 48 hours the patient was in coma; in the insulin-sensitive patient IV., a man aged 48, the disease came on suddenly in December, 1930; in the insulin-insensitive patient I., a woman aged 60, the patient developed vulvitis without symptoms of thirst or polyuria, the urine was tested and sugar was found; and in the insulin-insensitive patient III., a man aged 60, sugar was discovered fortuitously at a life insurance examination seven years ago, but none of the classical symptoms of diabetes mellitus have ever been noted and no therapeutic measures were taken until he developed first an external rectus and later a facial nerve palsy. The insulin-insensitive type is more common in but not confined to the elderly, whilst the insulin-sensitive type is commoner in the young. As diabetes mellitus becomes more frequent with increasing age it would appear probable—and my experience so far supports this deduction—that the commonest type of diabetes mellitus will eventually prove to be that which is not essentially due to insulin deficiency.

A further observation concerns the different reaction of the two types to change in the carbohydrate content of the diet. When high carbohydrate diets were first introduced the claim was made that the carbohydrate content of the diabetic's diet could be raised from the 50 g., then orthodox, to 200 g., without necessitating any increase in insulin dosage.⁷⁻⁹ It has been my experience that in many cases this claim is true, but it has been denied by other observers. The differentiation of diabetics into insulin-sensitive and insulin-insensitive types seems to provide the key to the discrepancy. In the cases examined so far it appears that insulin-sensitive diabetics will tolerate large increases of carbohydrate in the diet with little

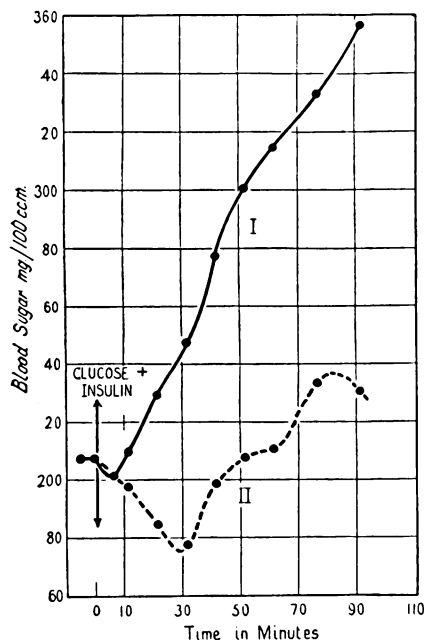


FIG. 1.—Simultaneous glucose and insulin test. Capillary blood-sugar curves.

Patient I.—Insulin-insensitive. Woman, aged 60, on a diet of 1500 calories containing carbohydrate 150 g., protein 80 g., fat 66 g., and 35 units of insulin daily. Passing small amounts of sugar.

Received 7.3 units of insulin intravenously and 43.8 g. of glucose orally. Fasting blood-sugar 208 mg./100 c.cm.

Patient II.—Insulin-sensitive. Woman, aged 21, on a diet of 2000 calories containing carbohydrate 208 g., protein 80 g., fat 94 g., and 95 units of insulin daily. Sugar-free. No hypoglycaemic attacks.

Received 7 units of insulin intravenously and 41 g. of glucose orally. Fasting blood-sugar 244 mg./100 c.cm. The curves have been charted so as to start at the same resting blood-sugar level.

or no increase in the amount of insulin required to keep the urine sugar-free; insulin-insensitive patients, on the other hand, pass sugar after only small increases in dietetic carbohydrate. For example, patient I. was always sugar-free when taking a diet containing 67 g. of carbohydrate and 20 units of insulin a day. Increase of the carbohydrate to 148 g., whilst keeping the calorie value of the diet the same, resulted in profuse glycosuria which was not controlled by 35 units of insulin a day. On admission, patient II., who was insulin-sensitive, was receiving a diet containing 65 g. of carbohydrate and was taking 45 units of insulin a day. Her physician had been quite unable to balance her, she was extremely wasted, and her urine contained sugar and ketones in large quantities. She was given a diet containing 200 g. of carbohydrate a day and rendered sugar-free with 95 units of insulin daily. After ten days of complete control, in which no hypoglycæmic attacks occurred, she was given an equicaloric diet containing 320 g. of carbohydrate. Glycosuria did not appear and some days later the insulin dose had to be reduced because of hypoglycæmic attacks.

It thus appears that the differentiation of diabetics into insulin-sensitive and insulin-insensitive types by means of the insulin-glucose test may prove to be of considerable practical importance as offering a means by which the appropriate diet can be chosen for the particular case. It is hoped that other observers will attempt to arrive at an opinion on this point. One thing, however, I would make clear. The observation that on a low carbohydrate diet a particular diabetic requires least insulin is no proof that the diet is the optimum from the point of view of the preservation of his health.

DISCUSSION

I have said that I think it probable that in those cases of diabetes mellitus which are insulin-sensitive the cause of the disease is deficiency of insulin, whilst in those cases which are insulin-insensitive the cause of the disease is not lack of insulin, but the restriction, to a greater or less degree, of an unknown sensitising factor. In previous publications I have communicated the results of work on healthy men and animals which demonstrated the existence of a factor rendering the body sensitive to insulin.^{4,5} It is of interest to inquire whether it is the restriction of this same factor demonstrable in healthy subjects which is responsible for the insulin insensitivity of a type of diabetes.

A characteristic of the insulin-sensitising factor of normal people is that the quantity of it present in the tissues at any time is determined by the amount of carbohydrate in the diet.⁵ When more carbohydrate is given to a healthy subject the body reacts by rendering itself more sensitive to insulin. Now it has been shown in the previous section that when more carbohydrate is given to an insulin-sensitive diabetic the insulin requirement does not increase and glycosuria does not appear. I have shown elsewhere⁴ that this apparent increase in efficiency of the injected insulin can satisfactorily be explained on the basis that these patients react to the increased amount of dietary carbohydrate by becoming more sensitive to the injected insulin. But in the case of the insulin-insensitive diabetic increased intake of carbohydrate results in glycosuria and consequent increased insulin requirement. Thus, these patients are abnormal in being unable to react to increase in dietary carbohydrate by increase in their sensitivity to insulin. It appears, therefore, justifiable to regard the insulin-insensitive type of diabetes as being due

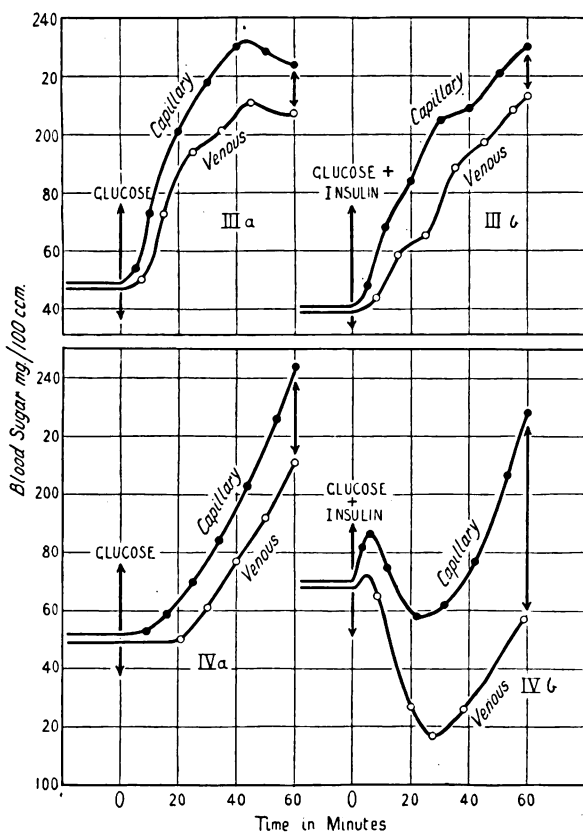


FIG. 2.—Simultaneous glucose and insulin test. Simultaneous capillary and venous blood-sugar curves (A.V. curves).

Patient III.—Insulin-insensitive. Man, aged 61.

Curve IIIa.—53 g. of glucose by mouth. Resting capillary blood-sugar 149 mg./100 c.cm., venous blood-sugar 147 mg.

Curve IIIb.—53 g. of glucose by mouth immediately preceded by 8.8 units of insulin intravenously. Resting capillary blood-sugar 141 mg., venous blood-sugar 139 mg.

Receiving a diet of 1570 calories containing carbohydrate 210 g., protein 70 g., fat 60 g. for the previous ten months. Insulin dosage raised steadily until, on admission to hospital, was receiving 85 units of insulin. This was inadequate. Every specimen of urine passed gave a complete reduction of Benedict's solution, and no hypoglycæmic attacks occurred.

Patient IV.—Insulin-sensitive. Man aged 48.

Curve IVa.—50 g. of glucose by mouth. Resting capillary blood-sugar 152 mg., venous blood-sugar 147 mg.

Curve IVb.—50 g. of glucose by mouth and 5 units of insulin intravenously. Resting capillary blood-sugar 171 mg., venous blood-sugar 169 mg.

Receiving a diet of 2493 calories containing carbohydrate 238 g., protein 102 g., fat 115 g., and 20 units of insulin a day. Consistently sugar-free.

* These doses of insulin and glucose were chosen before the scheme of dosage based on surface area was adopted. The dose on surface area would have been 58 g. of glucose and 9.7 units of insulin.

to lack of that same unknown factor which in the normal subject produces sensitivity to insulin.

On the balance of the evidence available I have suggested that this insulin-sensitising factor is an activator of insulin,^{1,2} but as yet there is no incontrovertible evidence whether the unknown is a factor, in the sense of being a definite substance, or a condition of the tissues in general which facilitates the action of insulin. It will be seen, however, that the nature of the unknown "insulin-sensitising factor" must be such that it is intimately concerned with the action of insulin and that its restriction will result in rendering a proportionate amount of the available insulin powerless.

The term insulin insensitivity has been used in preference to the term insulin resistance for two

reasons. Firstly, because in my investigations into the variations of insulin sensitivity in normal subjects I have seen no evidence of any factor which antagonises or resists the action of insulin itself, but only evidence indicating the presence of a factor which is complementary to insulin. Secondly, because the term insulin resistance has already been used with two different meanings.¹⁰ In one sense it appears to mean simply that the patient requires more insulin to produce hypoglycæmic symptoms than the physician expected. In the other sense it refers to those rare cases in which enormous doses of insulin, such as 1600 units a day, are insufficient to prevent the patient developing and dying in diabetic coma.^{11 12} These latter cases cannot be explained on the basis of lack of insulin, but I would suggest that they can be explained on the basis of extreme deficiency of the insulin-sensitising factor.

SUMMARY

It is shown that two different types of disease can be distinguished as causing the symptom-complex of diabetes mellitus. One, the insulin-sensitive type, appears to be caused by deficiency of insulin; the other, the insulin-insensitive type, is apparently due not to lack of insulin, but to lack of an unknown factor which sensitises the body to insulin. A test for distinguishing these two types of diabetes mellitus is described. The appropriate dietetic treatment of the two diseases may differ.

ADDENDUM

Since this paper was written I have read a publication by Boller and Uiberrack in the *Falta-festschrift* (Wien. Arch. f. inn. Med., 1935, xxvii., 75) which bears on these results. These workers chose diabetics of two types: those who required less insulin than was estimated to produce hypoglycæmic attacks, the "insulin-sensitive" group, and those who required more insulin than was expected, the "insulin-resistant" group. Amongst the different experiments performed one series is relevant to this paper. Insulin was injected and some hours later when hypoglycæmic symptoms appeared glucose was given by mouth. In the "insulin-sensitive" group the oral glucose resulted in a smaller hyperglycæmia than in the "insulin-resistant" group. The authors explain their results by the varying sensitivity, in the two types of case, of the mechanism which causes liberation of sugar into the blood stream. As my results show, this cannot be the explanation; for the difference is due not to swamping of insulin action by pouring of sugar into the blood, but to deficient removal of blood-sugar due to inefficient insulin action. Their results, however, are of importance as showing that the type I have called insulin-sensitive easily develops hypoglycæmic symptoms, whilst the type named insulin-insensitive develops these symptoms with difficulty.

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CARCINOMA OF THE ŒSOPHAGUS THE QUESTION OF ITS TREATMENT BY SURGERY

BY G. GREY TURNER, M.S., F.R.C.S.

(Bradshaw Lecture concluded from p. 72)

Œsophagectomy

It may be taken as an axiom that it is not practical to excise a sufficient length of the œsophagus for cancer and to make a union in situ, for the ends cannot be opposed without tension if more than 4 cm. is removed. This amount would not be sufficient for the eradication of any malignant neoplasm likely to be met with. A study of cancer of the œsophagus and its mode of spread shows that we must excise not only a sufficiency of healthy tube on either side of the growth, but as much extra œsophageal tissue as possible. Most growths are from 1 to 3 in. in length and because of the tendency to spread up and down under the mucosa, at least 1½ in. and better 2 in. should be removed beyond the margin of the growth on either side. In other words, it is essential to remove a large section of the œsophagus if the ablation is to hold out any prospect of eradicating the disease. Many growths are of such longitudinal length that nothing short of removal of the whole œsophagus can hold out any chance of success and any more limited excision is bound to be attended by recurrence. If these requirements are admitted, then it can only be in a few cases of carcinoma of the lower end that a direct anastomosis can be made between the mobilised stomach or the small bowel by the abdominal or abdomino-pleural route. Even if it is justifiable to contemplate this plan, it must be realised that the actual junction will have to be made to that part of the œsophagus where its blood-supply is the most precarious. In most cases when this has been attempted there has been leakage at the suture line.

Some of the operations for excision of the œsophagus which have been recommended and which are freely illustrated in books must be looked upon as largely armchair exploits and doomed to failure in practice. This especially applies to those methods which must rely for their success on the isolation of a considerable area of the œsophagus, which is thus denuded of its blood-supply at the part which is to be anastomosed to the stomach. Similarly those procedures which depend for their success on the displacement of a large part of the stomach into the chest have not been successful, largely because of the failure of the blood-supply of the displaced viscus. After all, the one essential is to remove the growth as completely and widely as possible and without reference to the repair of the œsophagus. If the patient can be safely piloted over this ordeal, the restoration of the power of swallowing need not present an insuperable problem.

There can be no doubt that in many cases in the past the real difficulty has been that associated with the exposure of such a deep-seated organ. In recent times however, since the practical methods of approach have been better understood, I think one may say that what has defeated our efforts on most occasions has been the comparatively advanced stage at which the patients reach us. As a rule it is possible to determine the presence of distant dissemination, but our methods of assessing the local extension of many of the growths have not been sufficiently helpful and definite to enable us

to say at what stage local fixation by extension of the growth has gone too far for possible removal.

Another great difficulty has been the question of infection of the cellular tissue. In my own cases some of the deaths have been due to technical errors which could be avoided. When I first contemplated the possibility of removing growths by the "pull-through" method, my principal concern was the question of hæmorrhage, and that still remains a main consideration. Though it may not be serious as borne out by several cases, including the one completely successful issue, one must admit that in those that have died this factor has sometimes played a considerable part.

CHOICE OF METHOD

As the result of the considerations which I have put before you I have formulated certain definite though admittedly tentative conclusions for my own guidance. If in a case of known cancer of this tube there is no evidence to show that there is already dissemination and nothing to suggest that local fixation is well marked, then I would undertake operative measures for its removal.

There are many successful cases on record of excision of malignant growths of the cervical œsophagus with restoration by plastic reconstruction with skin flaps. Most of these have really been growths of the lowest part of the pharynx and commencement of the œsophagus. The results have sometimes been very wonderful and encouraging, and the methods employed are now established surgical procedures. But I have only in mind growths which are strictly in the œsophagus at the root of the neck. In such cases the growth usually extends below the level of the manubrium in such a way that it is not possible to remove it with a sufficient margin of healthy tissue on either side and at the same time to make a plastic restoration. The problem is therefore the same as in connexion with the growths in the posterior mediastinum. When the growth is in the upper 2 or 3 inches the approach should be from the neck in the first instance. If it can be separated all round with the finger, then I should be prepared to pursue this as far down as it could be conveniently reached from the neck. If it were possible to ligature or to clamp the œsophagus well below the growth, then I should cut it across and bring the upper end out on to the chest wall as I have already described. If divided by the cautery or divided and thoroughly carbolised and bipped, the lower end of the œsophagus may be relied upon to look after itself and probably the upper part of its bed would become safely obliterated.

If the growth is situated in the lower 2 or 3 inches, then the approach should be from the abdomen. If the growth could be separated all round and the lower part of the œsophagus mobilised, then I would suggest that the case is worth the complete "pull-through" operation, and I would endeavour to carry out extirpation by that means. If, on the other hand, the growth was situated in the middle of the thoracic œsophagus, then my present view would be in favour of either the "pull-through" method or a combined posterior mediastinal and transpleural exposure, completing the procedure as in the successful case operated upon by Torek. The lower part of the œsophagus divided not less than two inches below the growth is left behind.

In deciding the route to be employed in any contemplated excision the type and build of the patient must be taken into consideration. Those of short stature, even though the chest is voluminous, have shorter œsophageal tunnels than others, and condi-

tions are still more favourable if there is marked kyphosis. In such subjects it is possible to make the fingers meet in the tunnel when passed from the neck and the abdomen. For the same sort of reason those who are rather tall and slight present a much easier problem for the transpleural approach. The type of costal angle gives a very good indication of these anatomical differences.

SELECTION AND PREPARATION OF PATIENTS

It will be well in considering this matter to be guided more by the vigour, physique, and especially courage of the patients, than merely by terms of years. It is most important that these patients should have a great desire for food and an ardent wish to have the power of swallowing restored. Above all, I think it is important that they should have proved that they are suffering from a mechanical disability rather than absorption or cachexia, as shown by the fact of their great and striking improvement after gastrostomy or jejunostomy. I should just like to say that I believe the majority of patients with gastrostomy will recover better in their own homes. In hospitals the routine of feeding may be quite in keeping with physiological requirements, but it takes little note of those psychological factors concerned in digestion and nutrition. At their own homes the patients may find it easier to establish a régime which will satisfy both requirements, and as a result it is often found that they do better in these circumstances.

The question of the preliminary collapse of one or other lung is very important, but so far as this step is concerned I am prepared to occupy a position of suspense. In my completely successful case I contemplated collapsing the left lung, thinking that any injury to the pleura was most likely to occur on that side. As a matter of fact it was well that I did not do so, for it was the right pleura which happened to be opened at the operation. At the same time I certainly think that if it is proposed to adopt the transthoracic route, then it would probably be wise to have the corresponding lung collapsed as a preliminary. The mere opening of the pleura need not in itself be serious, and, in fact, I know from actual experience that both sacs may be opened without any positive pressure arrangements and the patient may easily survive the accident. But there is another reason why it is most important that the pleura should be preserved intact if possible, and that is so that hæmorrhage may be circumscribed by the intact œsophageal tunnel. I believe that when the pleura is opened it is much more likely that bleeding will continue after the œsophagus has been separated from its bed, and in several cases I have been struck by the amount of blood which may be found in the pleural sacs in these circumstances.

Operative Details

"There is a time and a way in which all things can be done; none shorter—none smoother. For all noble things, the time is long and the way rude . . ."—*John Ruskin*.

The story of the introduction of the "pull-through" or collo-abdominal method was related in my Bigelow lecture in 1931, and it is not necessary to repeat it here. Suffice it to say that the first "pull-through" operation was completed in December, 1927. Having been fortunate enough to carry the method to a successful issue in one case and to have come very near success in others, one feels that it may now be looked upon as a surgical procedure which is, at least, provocative of serious consideration. When

called upon to repeat that operation, I would incorporate the following modifications:—

- (a) A better approach from the neck to be obtained by the excision of the inner half of the clavicle.
- (b) Taking much more care to distend the cellular tissue by injection and to carry out the enucleation with especial gentleness and deliberation.
- (c) The completion of the removal by drawing the oesophagus up into the neck, rather than downwards into the abdomen.
- (d) Allowing the oesophagus, withdrawn from its bed, to lie free on the front of the chest until such time as the cellular tissue spaces of the neck and thorax are safely shut off.
- (e) Taking more active steps to combat hæmorrhage and delayed shock.

To gain access to the upper mediastinum the removal of the inner half of the clavicle is of great assistance. This step was suggested by a study of a preparation of the inlet of the thorax given me by Sir James Berry. I first employed the method in carrying out exploration of a growth of the upper part of the oesophagus, and it proved so helpful that I have continued to use it. Still further room may be obtained by cutting away the upper left corner of the manubrium sterni, but I have not usually found this to be necessary. The removal of so much of the clavicle does not appear to interfere materially with the usefulness of the arm. The idea underlying the second modification has been mentioned in the section on anatomy, and I feel sure it has been helpful. The withdrawal of the oesophagus upwards seems to have the advantage that it is but retracing the steps imposed upon it in the process of development, and, moreover, vessels and nerve-fibres are more likely to separate easily and tear, if pulled against the direction in which they normally grow. Further, this upward withdrawal greatly facilitates the next modification of importance, for it is desirable to have as long a portion of oesophagus as possible to bring out of the wound. The idea of allowing the oesophagus to lie well out of the wound until such time as the cellular tissue is shut off is thoroughly sound and practical; moreover it is in keeping with the known success of the two-stage method of dealing with pharyngeal diverticula. I first thought of and noted this plan in January of 1931 and yet, so treacherous is memory, that it was subsequently overlooked in two cases which I always believe would very probably have recovered had it been adopted.

The last modification is almost self-evident, but I venture to think it is of first moment. There is so great a risk of reactionary or recurrent hæmorrhage that every means possible should be taken to anticipate its onset, and for this purpose most careful hæmostasis at the time of operation and early hæmodynamic blood transfusion are essential. If it is not justifiable to regard the growth as early and probably free from fixation, it would be wiser to adopt Torek's approach so that the exact condition could be investigated under the guidance of the eye before any attempt was made at removal. By this plan even pleura adherent to the growth might be excised, and very careful and deliberate separation can be carried out and more care exercised in the control of bleeding. In these operations the hæmorrhage is mostly venous and can be controlled by very light pressure, and if the pleura is not opened there is much likelihood of it being spontaneously arrested. Should it be too free, as shown by its escape from the tunnel into the abdomen or the neck, it may be controlled by temporarily inserting a gauze strand, taking the

greatest of care not to damage the pleura during its introduction. Snake venom as a hæmostatic may also prove valuable; I have not as yet employed it. Another plan, which I have contemplated, is to introduce a rubber tampon made of the large size colotomy tubing. This could be drawn into the abdomen from the neck or vice versa, a stiff oesophagus tube being used as a pilot. The colotomy tubing would be introduced in the collapsed state and inflated with air or hot fluid when in situ. Having served its purpose, the tampon could be gradually deflated and withdrawn a little at a time in order to allow the empty tunnel to collapse.

Review of Lessons Learnt

It is very surprising how few of the patients have actually died as the immediate result of the operation. This has only been the case in one patient, an example of a posterior mediastinal removal in which the patient succumbed before leaving the theatre, but that was an advance case in which the growth was very adherent and had to be peeled off the aorta. As a rule the patients have left the operating table in wonderfully good condition, and in many of them the condition for several hours, that is to say until some other and secondary changes have taken place, has not given rise to anxiety. Some of the operations have really been of great magnitude, and one would have expected them to be attended or followed by great shock. In the patient who completely recovered the operation took 1 hour and 40 minutes, and was very well borne. In a recent case, a not robust old lady of 75, the operation lasted the same length of time. The oesophagus was exposed by the transthoracic route and the growth removed (Fig. 3), but both the neck and the abdomen had to be opened to remove either end.

In spite of so severe an ordeal the general condition was wonderful throughout, and she returned to the ward in what was considered to be good condition.

Any operation destined to remove an organ like the oesophagus is in itself a very major proceeding which must be a severe tax on elderly people whose nutrition has been seriously imperilled before the operation is undertaken. Most deaths have occurred within 12 to 24 hours, and the inclination is to put them down to delayed shock, but the autopsy usually furnishes another explanation. In four cases of collo-abdominal removal, in which a post-mortem examination was made, the pleura was torn on both sides in one and on the left in the others, with hæmorrhage into the pleural cavity in all. This bleeding was of



FIG. 3.—Well-developed carcinoma, with only four months' history, removed by transthoracic route.

variable quantity and was undoubtedly often exaggerated in amount by admixture with pleural exudation, but in each case I was satisfied that the amount was enough to contribute largely to, if not to explain, the fatal result. Bleeding has never been alarming at the time of the operation, but it probably slowly continues for some hours after the interference, so that the patients may be said to run the risk of bleeding to death into their own pleural cavities. In the cases in which a transpleural approach has been used there was also bleeding into the pleural cavities, despite the fact that in these patients the operation was conducted under the guidance of the eye and no obviously bleeding points were left unattended. One can only conclude that there is a risk of continued oozing, and that when the pleura remains intact it is restrained by the confines of the tunnel. Even when the pleura is not torn there is usually some retropleural hæmorrhage, but it has never been great in amount and I have never seen anything more than a localised hæmatoma. In no case has there been any considerable hæmorrhage into the peritoneal cavity, probably because of the close of the abdominal hiatus. This is brought about by stitching the left lobe of the liver over the aperture or packing the lower end of the tunnel with omentum.

In an endeavour to guard against injury to the pleura I have injected quantities of weak local anæsthetic into the cellular tissue surrounding the oesophagus with the idea that the bulk of fluid would push aside the serous membrane and would also open up the cellular spaces, thus making separation easier and facilitating the removal of the oesophagus, while reducing traumatism to the minimum. If it was known to have occurred, then the most important factor in reducing any evil results is probably the complete expansion of the lung.

In those cases that survived the first 24 hours, death was due to sepsis in some form. In no case was there an acute spreading mediastinitis, but in two there was a low form of infection. The three cases that lived 7 days, 8 weeks, and 9 days respectively were most instructive, for in each there was the most wonderful evidence of repair of the media-

stinal tunnel. The main features of the first two of these cases were described in a discussion at the Royal Society of Medicine in December, 1933.⁴ A more recent case operated upon at the Hammersmith Hospital was equally instructive and encouraging and for our purpose more useful, as I am able to show you the parts (Fig. 4).

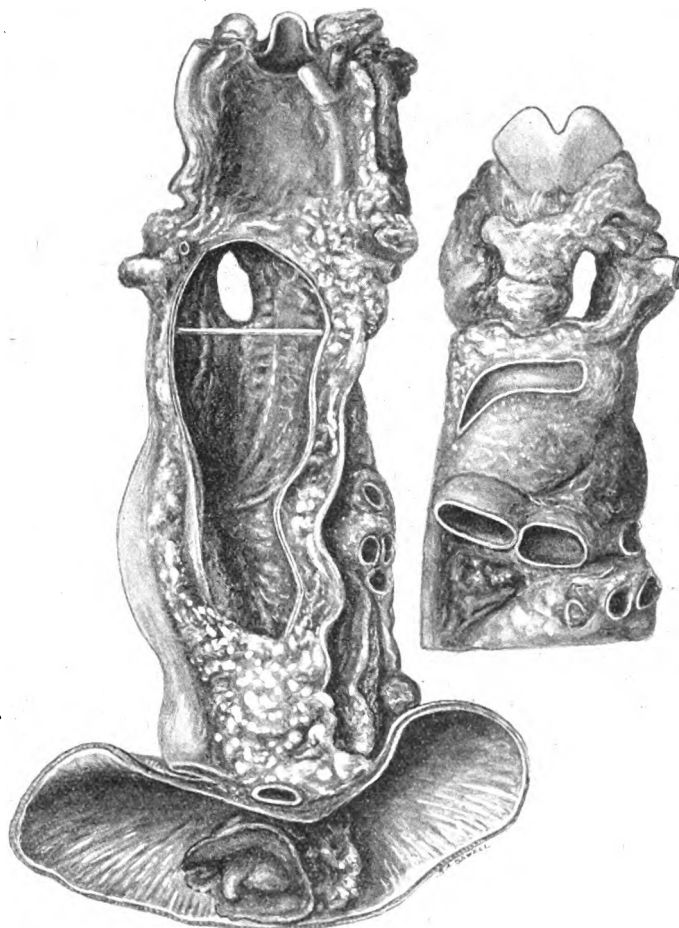


FIG. 4.—The parts removed from a patient who died nine days after excision of the oesophagus by the "pull-through" method. The "tunnel" is beautifully demarcated, and there is no evidence of spreading inflammatory trouble. The inset shows the upper aperture from the front.

operation. An examination after death showed bilateral broncho-pneumonia with old healed fibrocaceous tubercle of the right lung. The bed from which the oesophagus had been removed was safely sealed at its lower end, and for the rest was beautifully shut off by organisation of its wall. The latter was smooth and regular and covered with small healthy granulations. It was an example of perfect preparation for healing and a wonderful exhibition of what nature can do. Although the cavity had been flooded with infected material for at least a week there was no evidence of any active infection whatever, and on microscopical examination very few organisms could be found.

The naked-eye appearances were confirmed by the microscope, and sections made from the upper end of the oesophageal tunnel showed a typical layer of granulation tissue with fibroblastic proliferation and an infiltration with macrophages, but very few polynuclears. One vessel in the deeper part showed endarteritis. Staining showed some Gram-negative cocci limited to the surface

The patient was a man, 60 years of age, who was admitted to hospital with only two months' history of difficulty in swallowing. Investigation disclosed an occluding growth opposite the fourth dorsal vertebra. It was removed by the collo-abdominal method without any special difficulty. By a most unhappy mischance which I shall always regret the oesophagus was cut too short in the neck. As a result its lower edge separated from the skin and retracted exposing the cellular tissue deep in the neck to infection from saliva, &c. All our efforts to control the ravages of this disaster were of no avail. The wound in the neck further separated and left the entrance to the mediastinum widely exposed. Saliva and discharge found their way into the oesophageal bed, and some ounces of infected fluid were sucked up from this pocket several times a day. As a result his condition deteriorated and the gastrostomy began to leak. This was repaired, but nutrition was too much undermined and death occurred on the ninth day following the

⁴ Proc. Roy. Soc. Med., 1934, xxvii., 355.

layer. At the lower end of the tunnel the section showed an essentially similar picture, only here the tissue was looser and the limits of the area of granulations less distinct. The surface also showed a thick layer of fibrin but no organisms were seen.

This risk of infection of the upper part of the œsophageal tunnel can probably be avoided by deferring the actual excision of the œsophagus until some days after its enucleation. The use of B.I.P.P. may also be of some little help; it is smeared over the end of the cut œsophagus before it is withdrawn and is rubbed into the walls of either end of the tunnel.

During the process of separation of the œsophagus and during its actual removal, great care must be taken not to tear it, and complete mobilisation must precede any traction. Instead of pulling on the extremity of the œsophagus, it should be grasped with sponge handles, the surgeon changing the hold of the forceps in order to get nearer and nearer to the site of any remaining attachment. When the time for the attempt at removal of the œsophagus arrives, the presence of the gastrostomy is often an embarrassment, and in two of the cases it undoubtedly contributed to the fatal result. In order to expose the diaphragmatic hiatus it is essential that the stomach should be free, so that it can be drawn down and to the right in order to put the abdominal part of the œsophagus on the stretch. In order to permit of the free handling of the stomach it has sometimes been necessary

to separate it from the parietes and to re-attach the gastrostomy opening as a last stage in the operation or to remake the gastrostomy.

Although I do not think that patients thrive as well on jejunostomy feeding as when fed directly into the stomach, still I am persuaded that jejunostomy would be an advantage in many ways. It was very satisfactory in the case in which I had to remove the whole stomach with the œsophagus and in another case of total gastrectomy. I am hoping that some day we will get these cases at so early a stage that neither preliminary gastrostomy nor jejunostomy will be necessary.

An Improvised Œsophagus

"Nothin's finished till it's done."—*Mrs. Jorrocks.*

As a commentary on the subject will you forgive me if I merely mention the case in which I was able to complete the excision by the "pull-through"

method and to restore the function of swallowing by the construction of a new œsophagus. A short account of this case has already been published.⁵ This man went along quite happily until eighteen months after the primary operation when he commenced to lose ground until he died a month later from nephritis. An examination of the body did not disclose any very obvious signs of recurrence of the growth. There was a small mass in the cardiac end of the stomach about two inches away from the situation of the normal œsophageal opening, and on section this showed histological characters of a type similar to the original growth. The new œsophagus shows a beautiful wide tube with an average diameter of one inch (Fig. 5). The wall of the new œsophagus is smooth, and there is no sign of irritation or suspicion of ulceration. The junction between the skin and the intestine is almost imperceptible and just as smooth and nice as in an old gastro-enterostomy. The interior of the dermal tube has a curious ringed appearance, rather suggestive of the inside of the trachea. There are a few long hairs growing into the lumen but certainly not in excess. Histological examination

reveals no striking changes in the skin in spite of its adaptation to a new function.

I am glad to have this opportunity of acknowledging the help of my colleagues of the British Postgraduate Medical School and the Hammersmith Hospital.

⁵ THE LANCET, 1933, ii., 1315, and 1934, ii., 1293. Proc. Roy. Soc. Med., 1934, xxvii., 355.

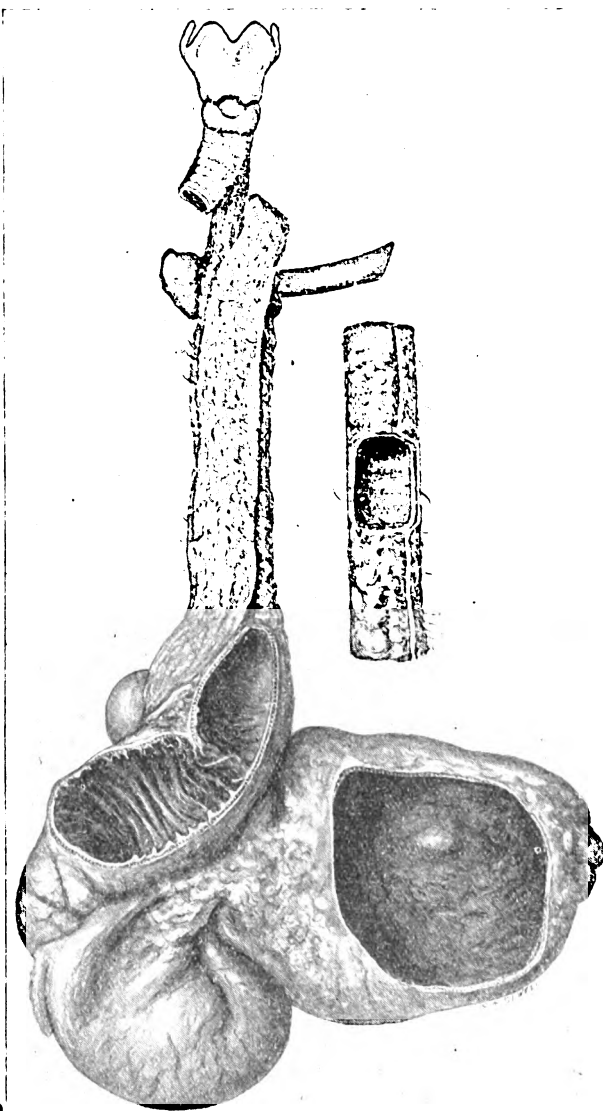


FIG. 5.—Antethoracic œsophagus which had functioned for eleven months (see text). The junction between the dermal tube and the small bowel is well seen. Inset shows the inner aspect of the dermal tube. The only area of recurrent growth is shown on the back of the cardiac part of the stomach.

KING EDWARD'S HOSPITAL FUND FOR LONDON.—The King has sent £1000 and the Queen 100 guineas to King Edward's Hospital Fund as their annual subscriptions.

AN EMBRYOLOGICAL INTERPRETATION OF CHANGES INDUCED BY OESTROGENS IN THE MALE REPRODUCTIVE TRACT

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BEIT MEMORIAL RESEARCH FELLOW

(From the Department of Human Anatomy, Oxford)

RECENT investigations on rats, mice, and monkeys indicate that changes induced by oestrone in the epithelium of the male reproductive tract may throw light on the aetiology of senile enlargement of the prostate in man. The morphological basis of the experimental response is thus a matter of the highest importance. Burrows,¹ following Lacassagne,² suggests that Müllerian epithelium enters into the formation of those organs (in particular the different lobes of the prostate) which in the male rodent respond to oestrone. This hypothesis, which immediately relates the effects of oestrone in the male to those produced by the hormone in the female (whose definitive reproductive tract is generally assumed to derive entirely from the Müllerian ducts) fails to account, however, for changes which oestrone occasions in parts of the male reproductive tract that undoubtedly are *not* related embryologically to the Müllerian ducts—e.g., in the rat, the entire urethra.¹ Unfortunately, too little is known of the development of rats and mice to allow even moderate certainty to embryological interpretations of the responses of the male to oestrone, while the homological relations of the rodent and human reproductive tracts are too speculative for comparative anatomical interpretations.

Facts derived from corresponding studies of monkeys are not subject to as many limitations, and they point to a more fruitful hypothesis, the gist of which is that oestrogens act specifically not only on Müllerian epithelium, but also on epithelium of the urogenital sinus. Many of the responses of the male become understandable in terms of this latter fact.

OBSERVATIONS ON MONKEYS

Apart from general fibromuscular growth in the stroma of both the prostate and the seminal vesicles, a response which can reasonably be regarded as an undifferentiated effect of oestrogens on tissues derived from the mesoderm of the genital cord, the conspicuous internal changes produced by oestrone in the reproductive tract of male monkeys are limited to the epithelium of the urethra and of the uterus masculinus (utriculus prostaticus). Of nine monkeys thus far tested,³ two (*Cebus fatuellus* and *Haplorhina jacchus*) showed no utricular response; one (*Presbytis entellus*) showed disorganised glandular hyperplasia of a utricle which normally comprises a regular system of tubular glands; and the remaining six, of which the best known is *Macaca mulatta*, the rhesus monkey, presented a utricular response essentially the same as that of the vagina to oestrone, the utricle becoming greatly distended and lined by a much stratified and desquamating epithelium. This type of utricular response is identical with the urethral response in those species in which the urethra is affected. In no case was the upper urethra responsive to oestrone; the sensitive region under the conditions of the present series of experiments extended from the region of the utricular opening to the urethral meatus. The upper insensitive section of the urethra arises with the bladder from the part of the ventral division of the entodermal cloaca lying above the opening of the Müllerian ducts, and it may include some epithelial remnants of the

Wolffian ducts, whose definitive openings are at the same level as the Müllerian.⁴

The uterus masculinus, like the vagina, is commonly believed to develop from the terminal part of the Müllerian ducts; histological difficulties, however, have obscured the picture of the actual embryological process. The view that unchanged Müllerian epithelium is responsible for the vaginal epithelium in man is not generally accepted. Alternative descriptions are that epithelium of the primitive urogenital sinus, into which the Müllerian ducts open, either partly,⁵ or entirely,⁶ replaces that of the Müllerian primordium of the vagina. It is reasonable to suppose that a corresponding process could occur in the male homologue derived from the distal part of the Müllerian ducts—i.e., the uterus masculinus—and histological evidence provided by some anomalous prostates from rhesus monkeys, that will be presented in detail elsewhere, favours the view that in this species sinus epithelium does in fact extend along and replace the Müllerian epithelium that forms the groundwork of the utricle. Far stronger support for this interpretation is provided by endocrinological evidence, not only from the rhesus but also from other species of monkey, for in them the vaginal and utricular response to oestrone is essentially similar to that of tissue undoubtedly derived from the epithelium of the urogenital sinus—i.e., in the female the epithelium of the vestibule, and in the male that of the urethra as far up as the opening of the utricle (which represents the external opening of the primitive Müllerian ducts). The facts thus suggest that in these species of monkey, the male oestrogenic responses under consideration do not fundamentally represent the responses to oestrogens of Müllerian epithelium, but of epithelium derived from the primitive urogenital sinus. Sinus epithelium reacts in essentially the same way as true ectodermal epithelium (see below), and although the epithelium of the urogenital sinus is generally regarded as being entodermal in origin, there is an alternative view, which has not been disproved, that ectoderm plays a large part in its formation (see Frazer,⁷ p. 432). The embryological topographical connexion between the urogenital sinus (as part of the original cloaca) and the primitive streak, the sinus's great sensitivity to oestrogens, and the primitive streak's capacity to elaborate organising substances, are facts which assume a related interest in view of the presumed chemical relationship between organising substances and oestrogens.⁸

The oestrogen-sensitive epithelium of the monkey is not limited to tissues derived from the urogenital sinus, but in many species extends for varying distances from the external genitalia to form a "sexual skin," a circumgenital area of surface skin which becomes highly coloured, thickens, and may even swell in response to oestrone. Although not so pronounced, the external epidermal growth is fundamentally the same, and may be regarded as part of the same process, as the more centrally occurring stratification of sinus epithelium; the external reactive area is the peripheral part of the total oestrogen-sensitive epithelial zone. If the extent of this zone in the female of a species is regarded as a species index of epithelial sensitivity to oestrone, an explanation is forthcoming for the fact that stratification of the male urethral epithelium in response to oestrone failed to occur in all species tested. In males, in which stratification did not occur, the corresponding females have no external sexual skin; in species in which the female has a sexual skin, stratification of the male urethral epithelium occurred.

IMPLICATIONS

The general hypothesis outlined here suggests that epithelial structures in whose development oestrogen-sensitive sinus epithelium has played a part should be expected to react when adequately exposed to the action of oestrogens. In the rhesus monkey, the urethral openings of the prostatic glands, which presumably give the topographical relations of the embryonic prostatic tubules, are placed almost entirely in the uppermost part of the region of the urethra which responds to oestrone. Nevertheless, only the proximal parts of the collecting tubules, and not the glands themselves, reacted in two monkeys of this species which were injected for 70 and 90 days respectively. It is possible that the glandular epithelium and the sinus epithelium, from which the glands arise, react differently owing to differential specialisation during development. On the other hand, it should be noted that the prostatic tubules of the mouse react only after very prolonged oestrone administration,¹ and it may also be remarked that true prostatic epithelium did show signs of reacting in two other species of monkey (*Cercopithecus mona* and *C. aethiops sabaeus*) after as little as two weeks' treatment.³ It is also of interest that one part of the human prostate, the posterior lobe, arises entirely from tubules which develop distal to the openings of the Müllerian and Wolffian ducts,⁹ and by analogy with the rhesus monkey, from the region of the urethra most sensitive to oestrogens. In view of the prevailing belief in the close chemical relationship of oestrogens and some carcinogens,¹⁰ it is therefore significant that although primary carcinoma may occasionally begin anywhere in an otherwise normal prostate,¹¹ it commonly starts in the posterior lobe.

A useful extension of the present hypothesis which should be mentioned here is that in species in which the uterus masculinus is an organ composed of a system of tubular glands only—e.g., man and *Presbytis entellus*—and in which it does not respond to oestrogens by epithelial stratification such as occurs in the rhesus monkey, the utricular epithelium represents Müllerian epithelium unchanged by epithelium of the urogenital sinus. There is some evidence, as yet unpublished, that the small columnar-celled glands occasionally found in the hydatid of Morgagni, the male rudiment of the cranial end of the Müllerian duct, develop and become distended in monkeys under the influence of oestrone; whether or not tubular glands derived from the terminal part of the duct would behave as uterine glands under the same conditions is at present a matter for conjecture. This problem has been considered elsewhere from the point of view of its possible bearing on the aetiology of senile hyperplasia of the prostate.¹²

The detailed data supporting the working hypothesis put forward here will be submitted for publication in the near future.

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THE TREATMENT OF CARCINOMA OF THE COLON*

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THE factors which govern our treatment of this grave disease are so numerous, yet so variable in their incidence and importance, that the problem of treatment differs greatly between one case and another. Personal experience then is apt to be an imperfect guide to the surgeon, and for that reason there are few subjects so worthy of discussion at a meeting of surgeons.

Preliminary Treatment of the Intestinal Obstruction

The large majority of patients when first seen by the surgeon are suffering from some degree of intestinal obstruction, and in a considerable proportion of these the obstruction is complete or acute and of several days' duration. It is one of the axioms of abdominal surgery that complete obstruction caused by colonic cancer must be relieved by simple drainage of the colon above the obstruction and that no attempt must be made to deal with the causative disease until the obstruction has been relieved and the patient has received the full benefit of preliminary drainage of the colon. The operation of caecostomy has for many years been that most commonly employed for this purpose, for it has the merit of being applicable to every case irrespective of the site of the growth if we exclude the caecum and ileocaecal orifice. It is clear that caecostomy is not the ideal operation for the relief of obstruction in the distal colon; but it works sufficiently well, for it can be depended upon to save the patient's life from the immediate threat of death from intestinal obstruction, and it is easy and safe to perform considering the circumstances. Above all, it leaves the field for the later operation of resection undisturbed and the surgeon unhampered. The choice of operation for this preliminary drainage is of the greatest importance; if the surgeon in his desire to achieve the ideal performs a colostomy near the obstruction he may later bitterly regret his choice. There is some divergence of opinion whether, in these cases of complete obstruction, the surgeon should proceed at once to perform a caecostomy through an incision directly over the viscus, or whether he should first explore the abdomen through a paramedian incision and then, unless the information he has thus obtained suggests a more effective operation, go on to perform a caecostomy.

There is room for both procedures, but personally I have a strong preference for an exploratory laparotomy unless the condition of the patient is desperate and makes the use of local anaesthesia highly desirable. If a spinal anaesthetic is to be employed—and this I believe to be the best for the great majority of these patients—then the duration of the anaesthesia will suffice for exploration and caecostomy and the complete relaxation obtained by this method will allow a gentle but efficient exploration and an easy closure of the incision.

The advantages of the exploratory incision are several. (1) The diagnosis of colonic obstruction can

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be verified; there can be no risk of overlooking obstruction in the lower small intestine. (2) The information to be obtained about the site of the growth, its extent and connexions, the presence of metastases in the liver, enables one to decide whether cæcostomy is the best operation under the particular circumstances and on one's plans for the resection of the growth at a later date. An opaque enema examination, after recovery from the preliminary operation, will not give us all this necessary information. (3) If cæcostomy is decided upon the exploratory incision will often help us to perform this operation much more easily than could be done through a limited incision directly over the cæcum for blind cæcostomy is sometimes a very difficult operation.

Cæcostomy was performed on 28 of my patients and in 20 of these at the close of an exploratory laparotomy. Of these 20 one died; in this patient compression of the cæcal pouch (the cæcum had been brought up to the skin) by the parietal muscles obstructed the outlet and the recognition of this was too tardy to save life. In one of the 20 blind cæcostomy had been attempted, but an exploratory incision was necessary to expose and deliver the cæcum through the iliac incision. In the other 8 patients a blind cæcostomy was performed, and of these also one died; strictly speaking, this death did not follow a blind cæcostomy, but was due to my inability to perform it owing to the high position of the cæcum and extreme distension of small intestine. Rather than make an exploratory incision which would have allowed me the valuable alternative of a colostomy of the transverse colon (always an operation to keep in mind in the presence of pelvic colon obstruction—the site of the disease in this patient) I performed a Witzel's enterostomy of the terminal ileum which failed to give the patient more than very temporary relief.

Removal of the Growth and Adjacent Portions of the Colon

The patient should by preparatory treatment be made as fit as the circumstances allow to undergo this. Sometimes much can be done to reduce the degree of chronic intestinal obstruction, from which the patient in great probability suffers, by a fluid but nourishing diet, the judicious administration of liquid paraffin, Epsom salts, and small doses of morphia. During this preparatory treatment a systematic examination, including an opaque enema examination, will have revealed the position of the growth. If the patient has had complete obstruction then his preparatory treatment will have been facilitated by the drainage of the colon which the cæcostomy has secured, and by irrigation of the colon through the cæcostomy during the three or four days preceding the operation of resection. At this operation, presuming there is no contra-indication to resection, there are in principle two methods open to us: (a) resection and immediate union of the two ends by suture anastomosis, and (b) resection without immediate union. The bowel ends are brought up to the surface of the abdominal wound and continuity between these is later established by the enterotome as in Paul's operation and its modern counterpart, obstructive resection.

RESECTION WITH IMMEDIATE UNION

Probably most of us have performed resection and immediate anastomosis of the ends of the colon, even in the presence of a moderate degree of intestinal obstruction, without the safeguard provided

by a preliminary cæcostomy, and have had many gratifying successes from this procedure; but collective experience shows that such a method entails an unnecessary degree of risk and it should therefore only be practised under very exceptional conditions, including that of great skill and experience on the part of the surgeon. Resection and suture anastomosis should only be practised after a preliminary cæcostomy or some other type of proximal drainage, even though the growth may have caused little or no obstruction in the colon. The cæcostomy may be performed at the same time as the resection operation, but to me this does not seem as sound a proceeding as the performance of a cæcostomy two weeks before the resection. When the growth to be resected is in the pelvic colon then an additional safeguard is the passage of a wide-bore rubber tube up the anus to a point in the colon several inches above the anastomosis.

This principle of proximal drainage before resection and anastomosis is modified in the treatment of growths in the cæcum and proximal colon. Here the orthodox method of operation in two stages, first lateral anastomosis between terminal ileum and transverse colon, or, as advised by Rankin,¹ implantation of the end of ileum into the side of the colon, and then, some two weeks later, resection of the short-circuited bowel holding the growth, gives excellent results. Wakeley and Rutherford² recorded 14 such operations in series without a death. My only criticisms of the procedure are that both stages of the operation are serious ones, for in both the colonic lumen is opened and sutured, and then the second stage may be troublesome on account of plastic adhesions around the anastomosis.

RESECTION WITHOUT IMMEDIATE UNION

The second method, that in which after resection of the growth the bowel ends are brought up to the abdominal wound for restoration of continuity at a later date, was first described by F. T. Paul³ forty years ago. During the past twenty-five years the great improvements in technique of intestinal surgery have led to the pretty general adoption of resection and immediate suture anastomosis as the method of choice, and Paul's method has taken a place second to this and as one to be employed under exceptional circumstances. In recent years, however, there has been a distinct movement to revive Paul's method with improvements in technique under the term "obstructive resection." For those who may not be familiar with this method the following brief description is intended.

The length of colon to be resected is determined; its mesenteric attachments are divided so as to allow removal of a maximum amount of mesenteric tissue; above and below the colon must be extensively mobilised so as to allow the bowel ends to be brought up to the abdominal wound without tension, yet without sacrificing the thoroughness of the resection. Two crushing clamps (Schoemaker pattern) are then applied, about $\frac{1}{2}$ inch apart across the upper limit of the loop to be resected and two across the lower limit. (Fig. 1.) The resection is now completed by dividing the bowel with the cautery between each pair of clamps. The posterior peritoneal gap is repaired, and then the two limbs of the bowel are tacked together by the finest catgut sutures over a length of 3-4 inches from the clamps so as to produce the familiar double-barrelled gun arrangement. The bowel ends each firmly in the grasp of a crushing clamp are brought out through the abdominal wound which is closed snugly around

them. The skin edges around the emerging bowel should be sutured to the bowel wall at a few points in order to cover over the raw area and to prevent premature retraction. (Fig. 2.) The crushing clamps are removed on the third day and an enterotome is introduced then or on the following day to a depth corresponding to the length of coaptation of the two limbs of bowel. (Fig. 3.) The enterotome should at first be screwed just tightly enough to afford a firm grip of the partition, and is gradually tightened up during the next two days. A lengthy communication between the two limbs of the colon is crushed out in six or seven days and usually a natural bowel action through the rectum follows within a day or two. The faecal fistula that remains tends to shrink and the amount of faecal discharge to diminish; the operator may close the fistula by an extraperitoneal operation at his own discretion.

This method may be employed for the resection of any part of the colon except of course the lower pelvic colon, for here the lower stump of bowel is too short to allow of its being brought up to the abdominal wound. Difficulty too will be experienced at the upper end of the pelvic colon, particularly in stout patients, for the absence of a proper mesentery to the iliac and descending colon may limit the length of the upper stump and tension or insufficient length of resection must not be tolerated as a means of securing coaptation of the two limbs of bowel. Under these circumstances either the ends of the bowel should be brought out of the wound without attempting to coapt them, and later, when the bowel is healthy and the patient is in good condition, the ends can be united by intraperitoneal suture, or the abdominal wound should be prolonged to allow of resection of the descending colon and splenic flexure in order that the transverse colon may be utilised as the upper limb in the wound. Obstructive resection can be used very satisfactorily for cancer in the proximal colon.

I have performed by this method right hemicolectomy in 8 patients without a death or serious complication; the discharge of ileal contents on to the abdominal wall for some two weeks after the operation may seem a serious objection to the method in this situation but in practice I have seen no harm result from this and the inconvenience is no greater than that after an open caecostomy. Obviously this method should not be practised on a patient suffering from a complete or acute obstruction, but it may properly be performed after a preliminary caecostomy, distasteful as it may seem to inflict for a time two separate faecal fistulae on the patient. It may be employed in patients suffering from chronic intestinal obstruction without preliminary caecostomy, and in these the colonic contents should be displaced from above downwards into the loop to be resected before the application of the upper crushing clamps, or, if this is insufficient to relieve the loaded colon, then after completion of the operation and protection of the wound the clamp can be removed from the upper limb of bowel and a tube tied into the end. To facilitate this the upper limb should be arranged to project 2 or 3 inches beyond the surface of the abdomen; this loop with its attached tube can then pass through the dressings and fastenings. Lahey⁴ applies this method of securing immediate drainage of the proximal intestine to resection of the right colon in the presence of intestinal obstruction and I am satisfied that the method is a valuable one under these conditions, and is always practicable because the upper limb is obtained from the terminal ileum.

The following advantages of obstructive resection will be readily appreciated.

1. The operation is much shorter in duration and easier. This is a substantial merit if the patient is a stout person whose colon is difficult of access and whose mesenteries are heavily fat laden. Under such conditions resection and anastomosis is a long and laborious operation and is often followed by severe shock; the operator too is tempted to hurry over the resection stage because of the amount of work that still remains to be done. In the obstructive method, as Devine⁶ points out, almost the whole of the operator's time and care are spent on the essential part of the operation—the complete removal of the malignant growth and its connexions. For these reasons the method should always be employed when the resection is a complicated one involving other viscera or the parietes.

2. The operation with ordinary care is an aseptic one, and the operator cannot fail to be struck by the clinical evidence of this.

THE METHODS COMPARED

How do these methods compare, and why has Paul's method in a modified form been revived? Resection and suture anastomosis at its best gives a very good result with a shorter and pleasanter convalescence than the obstructive method with its faecal fistula and the secondary operation for the closure of this. The fundamental objection to suture anastomosis after resection is the high mortality and morbidity-rate which it entails in the hands of most surgeons. To quote from my own experience—in 39 operations of resection and anastomosis there were 9 deaths (21 per cent.), and amongst the patients who recovered there were several whose convalescence was marred and protracted by wound suppuration, faecal fistula, and illnesses arising from these complications. In 30 consecutive resections performed by obstructive resection there were 3 deaths (10 per cent.), and very few complications of any kind amongst the patients who recovered.

I do not attach much importance just to the contrast between the two mortality-rates for each series is a small one; but a consideration of the modes of death and of the difference in the convalescence after the two methods, in conjunction with the contrast in mortality-rate, does suggest

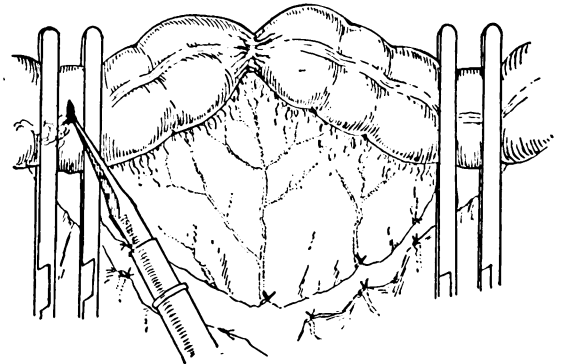


FIG. 1.—Obstructive resection. Division of colon with cautery between crushing clamps.

that obstructive resection is a valuable method, and one always to keep in mind at least as an alternative to resection anastomosis.

Of the 9 deaths in the resection anastomosis series, 2 occurred within two days of the operation and were plainly due to the severity of this; both patients were stout and had deep abdomens and in 1 a previous colostomy near the growth increased the magnitude of the operation. The other 7 all made good recoveries from the operation and made satisfactory progress for at least four days; after

that time relapses occurred, sometimes sudden in onset with severe abdominal pain and rapid collapse—plainly due to gross leakage at the anastomosis—in others less sudden with rise of pulse-rate and temperature, abdominal discomfort evidence of wound infection, and later faecal discharge and progressive cardiac muscle failure.

Of the 3 deaths after the obstructive method 2 were caused by acute intestinal obstruction beginning three or four days after operation; in one of these a large portion of the anterior abdominal wall had been removed with the growth and probably the small intestine became adherent to the raw area which inevitably resulted; in the other, obstruction was due to the small intestine becoming trapped in the foramen created by bringing up the stumps of the pelvic colon to a left iliac incision. The third death was due to faulty application of the enterotome which was screwed up much too tightly when first inserted. Severe abdominal pain and collapse followed in a few hours, but as the patient was known to have gross metastases in the liver no further operative interference was attempted.

The 3 deaths after Paul's operation do not seem to me to be due to defects inherent in the method, whereas the 9 deaths and the protracted convalescences in some of the survivors after suture

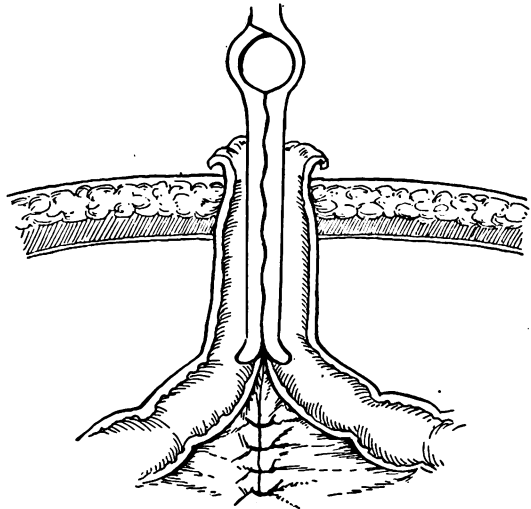


FIG. 3.—Obstructive resection. Re-establishment of continuity of colon by crushing intervening bowel walls with enterotome.

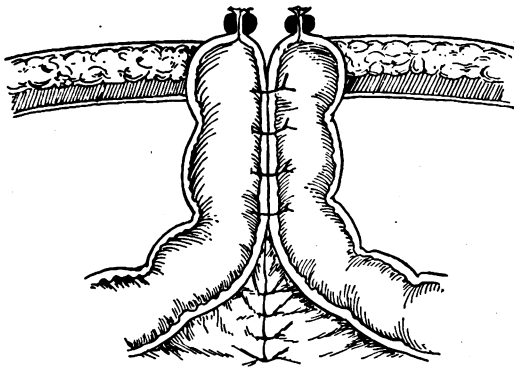


FIG. 2.—Obstructive resection. Coaptation of terminal limbs of colon by sutures: ends of colon, each in grasp of a crushing clamp, fixed in abdominal wound.

anastomosis can hardly be dismissed as due to avoidable or very unusual causes. Seven of these deaths were unmistakably due to leakage or gross infection at the anastomosis, and in view of the interval of time (four days at least) between the operation and the onset of the first symptom, it may be inferred that the infection originated within the bowel and travelled through anastomotic margins devitalised by suturing.

The risk of infection and leakage at the anastomosis, after the mechanical support of the sutures has ceased to be effective, remains inherent in all suture anastomoses of a functioning colon; particularly so in cancerous obstruction, for here the bowel wall in the vicinity of the growth is infected and the stagnant faecal contents are abnormally virulent in their toxicity. A proximal fistula (caecostomy) will by diverting a portion of the faecal stream and flatus relieve the anastomosis of some of the strain to which otherwise it would be subject, and by allowing the means for a previous cleansing of the colon will have reduced the toxicity of the contents, but the extent of this relief in any particular case is uncertain and cannot be depended upon to abolish the risk of infection and breakdown of the anastomosis.

Resection of Growths in the Lower Pelvic Colon

In the lower pelvic colon, after an adequate resection of the growth, the lower stump is too short to permit of a reliable suture anastomosis and obstructive

resection is still less practicable. A large number of operations have been devised to meet the problem; some of these are chiefly noteworthy as tributes to the endurance of the human species. I shall mention four: the first two are suitable for growths at or near the pelvirectal junction, one of them entailing a permanent colostomy, while the other does not; the second two are suitable for growths a few inches above the pelvirectal junction, and of these again only one entails a permanent colostomy.

1. *Abdomino-perineal excision of the rectum.*—A well-established operation the merits of which it is unnecessary to describe.

2. *Abdomino-anal excision of the rectum* in which the stump of the pelvic colon is pulled through the anal sphincters—after removal of the rectum and the mucosa of the anal canal—to the site of the anal orifice. A description of this operation, as performed by Prof. Sebrecht, of Bruges, was given by me at a recent meeting of the proctological section of the Royal Society of Medicine⁶ and was severely criticised on the ground that it entailed a serious risk of sloughing in the transplanted colon.

3. *Anterior or intraperitoneal resection of the rectum.*—In this operation after the necessary resection of bowel the stump of the rectum is invaginated, dropped into the bottom of the pelvis, and is covered over by suturing the gap in the peritoneal floor of the pelvis. The end of the pelvic colon is brought out through a small left iliac incision as a terminal colostomy. This operation, though a very safe one, is open to the criticism that the patient is left with an intact but functionless sphincter mechanism around the anal canal.

4. The *Rutherford Morison type* of operation in which a direct union between the open ends of the pelvic colon and the stump of the rectum is effected over a wide bore tube. One end of the tube must be secured in the end of the pelvic colon by a transfixion ligature and the other end is passed into the rectum through the anus, where it is drawn down by an assistant. Continuity of the bowel ends can now be restored by invagination and sutures.

Before undertaking either of the two operations which aim at reconstruction of the rectum—the abdomino-anal and the Rutherford Morison types—the surgeon will be well advised to carry out a colostomy of the transverse colon some three or four weeks previously. The colostomy should be of the Sistrunk type, in which the ends of the colon are completely separated by a bridge of skin. I began to perform such a colostomy in this connexion 3½ years ago and have never since omitted to do it before attempting reconstructive operations on the lower pelvic colon and

rectum. Devine⁷ has described and advocated a colostomy of the transverse colon as an essential preparatory measure to all anastomosis operations on the lower pelvic colon, and the surgeon who is unaware of the value of this step should acquaint himself with Devine's convincing article on the subject. A colostomy of the transverse colon in which the ends are effectively divorced prevents faecal material entering the colon distal to the colostomy; by daily irrigation it allows the removal of faecal material already present and the cleansing of the colonic mucosa; further, it puts the distal colon entirely out of action until complete healing of the transplanted bowel has taken place. It can be easily closed afterwards by the enterotome.

The danger of all anastomosis operations in this region is that of sloughing of the bowel, and this is due to the combined effects of infection from the faecal traffic and impairment of blood-supply from suturing and encroachments on the mesentery; remove the infective element entirely and the impairment of blood-supply loses most, if not all, of its terrors for the surgeon.

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THE PRODUCTION OF A NEUROTROPIC STRAIN OF RIFT VALLEY FEVER VIRUS

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(From the Wellcome Bureau of Scientific Research, London)

SINCE Pasteur first showed that the street virus of rabies can be altered by continued passage in the brain of the rabbit, much evidence has accumulated to show that other viruses may be experimentally modified by changing the substrate on which they grow. Thus, Theiler (1930) found that the virus of yellow fever was modified by passage in the brains of mice, and that eventually its capacity to produce viscerotropic lesions in rhesus monkeys was practically abolished. Nieschulz (1932) and Alexander (1933) similarly produced a neurotropic strain of horse-sickness virus by repeated mouse brain passage. These efforts at modifying the characteristics of viruses involved the use of an animal which is not normally susceptible to the ordinary strain of the virus. Recently, however, Findlay and Stern (1935) have shown that it is possible temporarily to inhibit certain virus activities by means of the protective action of immune serum. When rhesus monkeys were injected intraperitoneally with yellow fever immune serum, before inoculating the ordinary yellow fever virus intracerebrally, it was found that the animals died, not with necrosis of the liver, but from encephalomyelitis, thus demonstrating the essential neurotropism of the yellow fever virus. In view of the result obtained in yellow fever, it appeared not improbable that a similar method might reveal a neurotropic activity in certain viruses, which

so far had shown only viscerotropic characters. Further, it seemed possible that intensive passage under these conditions might result in the production of a neurotropic fixed virus variant.

In the present communication the results are recorded of applying this experimental procedure to the virus of Rift Valley fever.

THE VIRUS

Before describing the production of a neurotropic strain of Rift Valley fever virus, it may be of interest very briefly to recall the main facts in regard to the ordinary or viscerotropic strain. The virus was first isolated by Daubney, Hudson, and Garnham (1931) in Kenya where it caused a great mortality of ewes and lambs; it was also found to be pathogenic for man, producing a dengue-like disease, but without any rash. Findlay and Daubney (1931) showed that mice and other small rodents are particularly susceptible to the virus, since they die with widespread necrosis of the liver a few days after inoculation, while rhesus and other monkeys develop a non-fatal febrile reaction, not unlike that seen in man, associated with focal necrosis of the liver (Findlay 1931-32 and 1932-33). The virus has now been maintained for nearly five years under laboratory conditions, and during this period has never shown any signs of neurotropic activity; it has maintained unimpaired its pathogenicity both for men and mice. In the latter species, an intraperitoneal inoculation of 0.2 c.cm. of a liver suspension diluted 10^{-9} or 10^{-10} is almost always fatal. Death with liver necrosis also follows intracerebral or intranasal inoculation.

THE NEUROTROPIC STRAIN

Despite the great susceptibility of mice to the ordinary or viscerotropic strain of the virus, it has proved comparatively easy to produce a neurotropic strain in this species, the technique employed being based on that used by Findlay and Stern (1935) in the case of the yellow fever virus. Mice were first injected intraperitoneally with human immune serum derived from a recent laboratory infection. Fifteen minutes later they were inoculated intracerebrally with 0.03 c.cm. of blood from a mouse dying of Rift Valley fever. In the case of the first transfers the mice were killed 2-3 days after inoculation when the infected brain tissue was passaged. Later the mice were allowed to develop nervous symptoms, which usually came on 3-5 days after intracerebral inoculation and consisted of paresis of the hind and fore legs, circular turning movements and epileptiform crises. One strain which has passed through more than thirty intracerebral passages shows all the features of a fixed neurotropic variant. The symptoms exhibited by the mice have all been referable to the central nervous system, while the lesions present have been those characteristic of a meningoencephalomyelitis, destruction of neurones, perivascular infiltration, with slight involvement of the meninges, and occasionally extensive necrosis of the brain substance. In certain nerve-cells intranuclear inclusions have been found, very similar to those produced by the neurotropic strain of yellow fever virus. In the earlier passages, in addition to these nervous changes, certain mice exhibited small areas of focal necrosis in the liver, though the widespread damage characteristic of the viscerotropic strain was absent; hæmorrhage in the stomach was not found. In later passages, the lesions are confined to the central nervous system. After intraperitoneal inoculation of the neurotropic strain, the virus circulates in the

blood stream for a few days, then tends to localise in the spleen. Quite frequently, however, and certainly more often than is the case with neurotropic yellow fever virus, adult mice inoculated intraperitoneally have developed nervous symptoms. Intraperitoneal inoculation accompanied by cerebral trauma localises the virus in the brain as in the case of yellow fever. Intranasal instillation of the neurotropic virus in mice is also followed by the development of encephalitis.

Rats, field voles (*Microtus agrestis*), and ferrets have developed encephalitic symptoms after inoculation with the neurotropic strain of Rift Valley fever virus.

When rhesus monkeys are inoculated with the viscerotropic strain of Rift Valley fever virus, whether by the intraperitoneal, intracerebral, or intranasal route, they have never developed anything more than a short febrile reaction, and histologically have merely exhibited focal necrosis of the liver. When, however, they are inoculated intracerebrally with the neurotropic strain, death has invariably resulted with the symptoms and lesions of encephalitis. The same result has been obtained after intranasal instillation. If the virus has been inoculated intraperitoneally without cerebral trauma, no reaction has occurred, though immunity has subsequently developed; when, however, an intracerebral injection of starch has accompanied the intraperitoneal inoculation, encephalomyelitis, as in the case of mice, has followed.

The pathogenicity of the virus for monkeys is thus decreased when the intraperitoneal route of inoculation is alone employed, but increased when the virus is given the opportunity of obtaining access to nervous tissue.

The reaction of sheep and lambs to the neurotropic strain of Rift Valley fever virus is at present under investigation.

SUMMARY AND CONCLUSIONS

A neurotropic strain of Rift Valley fever virus has been produced in the mouse. After more than 30 passages, it has become "fixed" for nervous tissue and when inoculated intracerebrally it always produces encephalomyelitis in mice with an absence of liver necrosis.

Rhesus monkeys also succumb to encephalomyelitis when inoculated intracerebrally or intranasally with the neurotropic strain of Rift Valley fever virus. When inoculated intraperitoneally they exhibit only a very slight febrile reaction unless the central nervous system is at the same time traumatised; they then develop encephalitis.

The production of a neurotropic form of Rift Valley fever virus in a highly susceptible animal, by means of the restraining action of immune serum, opens up the possibility of producing similar variants in the case of a number of other viruses. It also offers a possible explanation of the occurrence of nervous sequelæ in certain virus infections which do not ordinarily involve the central nervous system.

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AN OPERATION FOR HYPOSPADIAS

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In common with many others, I got my first understanding of hypospadias and my first successes in its treatment by following the teaching of Edmunds.¹ For the first time he described the separate elements of the deformity, gave rational ways of overcoming them, and convincing proof that these ways could be successful. I think, however, that I am not alone in finding two objections to the technique he describes. The first is that it is difficult both to understand and to perform; even when one has obtained a mental image of exactly what one intends to do, the right arrangement of the "dog-ear" flaps so that they shall lie under even tension all over needs experience as well as a good dressmaker's eye.

The second objection is more important: it is that there is one weak spot in the new urethra, the point where the deep and superficial lines of sutures cross. Here there is a short direct outlet for urine passing along the channel, only controlled by what-

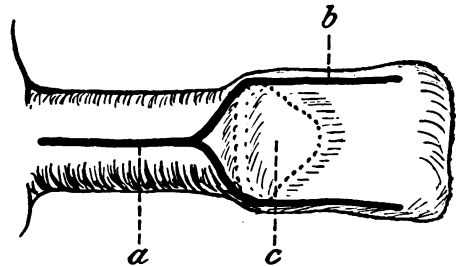


FIG. 1.—Outlining of incision for transplantation of prepuce. (a) Split down dorsum of penis. (b) Incision along outer edge of hood of prepuce. (c) Outline of glans seen through prepuce.

ever immediate adhesion there may be in the sewn skin edges; and it is here that a sinus not infrequently forms, needing a secondary operation for its closure.

I believe the following procedure, admittedly based on Edmunds's technique, is easier to understand and perform, and less liable to fistula formation. I derived it from considering that if one had to make a tube like the urethra on any plane surface of the body, and had unlimited skin to do it with, there would be one obvious method of choice. This would be to cut out a flap of skin alongside the floor of the new passage, to turn this skin back and suture it to form a tunnel, and then to cover in the raw area left by pulling across it another and larger flap from the other side. From a tube formed in this way there could be no direct exit for fluid at any point, as the two lines of sutures lie far apart, and in consequence the probability or primary complete healing would be very high.

In the penis of hypospadias there is of course not nearly enough skin to allow of this being done without dangerous tension; but there is close by a sufficient available reserve in the prepuce. Where my method differs from that of Edmunds is that instead of dividing this skin into two and swinging each half round underneath, I transplant it back up the dorsum of the penis, and so free the original skin

¹ THE LANCET, 1926, i., 323.

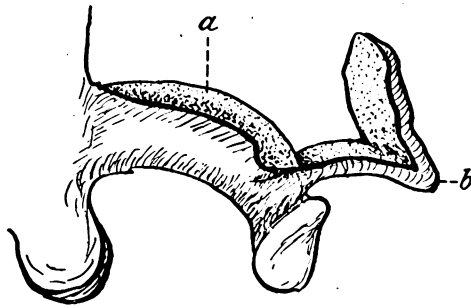


FIG. 2.—Prepuce dissected up and split into a ribbon ready for transplanting into the bare area left by the retraction of the edges of the dorsal incision on the penis. (a) Bare area on penis. (b) Original tip of prepuce.

of the sides and back for the simple tunnel formation I have described. I have sometimes tried to explain the idea by comparing it to the changing of a single-breasted coat into a double-breasted one; the necessary fullness for the overlap being given by the insertion of a new piece of material down the middle of the back.

TECHNIQUE

1. *Transplantation of the prepuce.*—An incision is made straight down the dorsum of the penis from its root to the base of the prepuce. Here it diverges to either side along the sides of the "hood," running about two-thirds of the way along the sides of this.

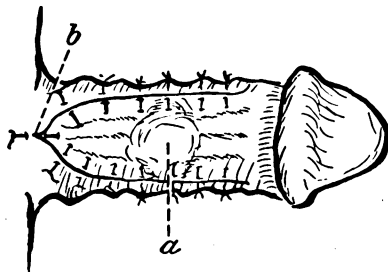


FIG. 3.—Dorsal view of penis after transplantation of the prepuce. (a) Original tip of prepuce. (b) Apex of dorsal incision.

The two layers of skin in the hood are then separated, so that a single broad ribbon is produced; this is done very gently, as much as possible by blunt dissection without injuring the large veins. There is no objection to leaving a loose sack of skin where the tip of the prepuce originally lay.

The dorsal incision retracts into a wide gap as soon as it is made, and into this the ribbon is now fastened by vertical mattress sutures, with its pointed tip fitting comfortably into the beginning of the cut at the root of the penis.

2. *Straightening the penis.*—This most important

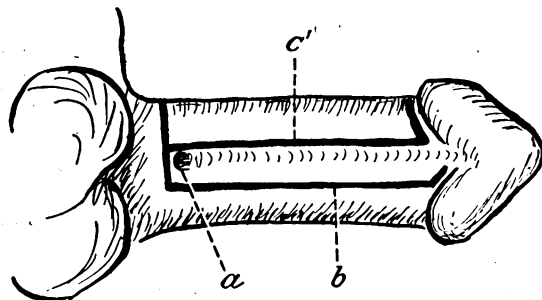


FIG. 4.—Outlining of flaps for making new urethra. (a) Opening of urethra. (b) Incision freeing lining of new urethra. (c) Incision freeing flap that will cover the raw area left by forming new urethra.

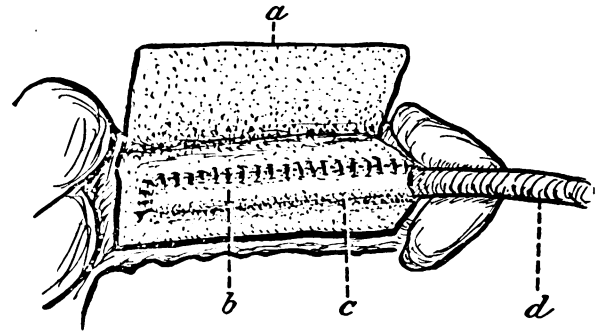


FIG. 5.—Appearance when the new urethra has been formed, but not yet covered in. (a) Outer flap raised, ready to be pulled across the raw area. (b) Line of continuous Connell type stitches forming new urethra. (c) Gutter showing line of reflexion of inner flap. (d) Catheter in urethra.

step in the operation is done exactly as described by Edmunds, either at the same time as the implantation of the prepuce, or later. The whole of the fibrous band which ties the penis into a permanent chordee shape in any marked degree of hypospadias is freed from the body and allowed to retract towards the base, carrying with it the urethral opening, which thus comes to lie much further away from the glans than it did originally. The raw gap so left is easily covered in from the sides owing to the relaxation given by the dorsal insertion. This

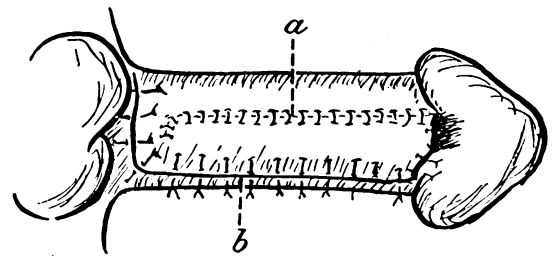


FIG. 6.—Appearance at end of operation. (a) Deep line of sutures, shown as if visible through skin. (b) Superficial vertical mattress sutures.

straightening of the penis should be done early in order to allow of its proper development; some time during the second year is a suitable time, as before that the small size of the parts makes operating very difficult.

3. *Construction of urethra.*—About the age of four is a suitable time for this. It should never be done till at least six months after the first operation, in order to let the penile skin regain its normal elasticity and looseness.

Two longitudinal incisions outline the skin which

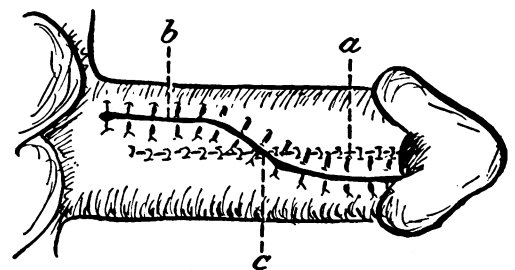


FIG. 7.—Approximate lines of sutures in Edmunds's operation. (a) Deep line of sutures. (b) Superficial line of sutures. (c) Weak point in floor of new urethra where the two lines of sutures cross.

will form the new urethra, that on the side from which the inner flap is to be raised being naturally further from the mid-line than the other. Each flap is freed by lateral cuts to appropriate distances at the top and bottom of each incision, and they are gently dissected up. A small rubber catheter is now passed, lubricated with 1/1000 flavine in paraffin, and over it the inner flap is turned back and sutured in position by a continuous catgut suture. This suture should be of the Connell type, only picking up the deep surface of the skin, and not penetrating to the lumen of the new urethra, so that no suture can convey urine into the tissues by capillary attraction. It seems to me that this lateral line of non-

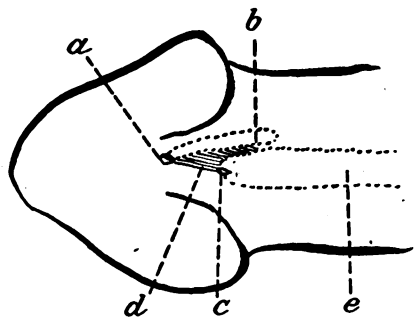


FIG. 8.—Diagram of connexion of pinhole meatus and blind sinus in first degree hypospadias. (a) Opening of blind sinus. (b) End of sinus. (c) Pinhole opening to urethra. (d) Tissue divided to connect openings. (e) Urethra.

penetrating continuous suture must be considerably more waterproof than the median interrupted stitches tied in the lumen of the urethra which are used by Edmunds. The outer flap is then sewn into position by vertical

mattress stitches, and it will be seen that the two suture lines lie far apart. At the only point at which it may look that they would coincide, just below the original opening, the retraction of the scrotal skin ensures a wide difference of line. For all the stitching I use a suture which I originally got Messrs. Armour and Co. to make for intestinal anastomoses in infants, a very fine straight round-bodied eyeless needle carrying 6/0 chromic catgut.

The catheter is left in for twenty-four hours. This is not long enough to start a urethritis, but allows time for the coagulation of the tissue juices to seal the wound and waterproof it against the flow of urine.

RESULTS

I have tried this method on eight cases, all of which have healed by first intention without a fistula. I have also used it successfully in a reversed form for a case of epispadias, transplanting the apron-like prepuce found in this condition into the ventral surface of the penis, and then covering in the deep urethral gutter with a double flap of the kind described. (The split glans can be easily closed by simple rawing and suture of its dorsal edges.)

A NOTE ON FIRST-DEGREE HYOSPADIAS

A quite common deformity is that in which the urethra ends in a pinhole meatus within the V-shaped area of skin under the glans. A formal plastic operation of the kind described would be quite useless, even if possible. The only disability is that the flow of urine, although delivered to almost the right place at the tip of the penis, dribbles downwards instead of spurting forwards owing to the opening being a pinhole on the floor of the urethra. Now it is a curious thing that in many of these cases there is a blind sinus lined by mucous membrane opening closer to the end of the glans, and running backwards

half an inch or so, deep to the urethra proper. I have in three cases of this sort connected the two openings by passing one blade of a small blunt-pointed scissors into each and cutting the tissues between. The rather free bleeding resulting can be controlled by stitches passed with the fine needle described. The results have been excellent. The advantage of enlarging such an opening towards its normal situation instead of away from it is obvious, and there is no tendency to stenosis.

PNEUMOCOCCUS MENINGITIS FOLLOWING TONSILLECTOMY AND TERMINATING IN RECOVERY

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PNEUMOCOCCUS meningitis may either be a primary infection, or, more commonly, an extension from a focus elsewhere in the body. In most of the recorded cases it has followed infection of the ear or pneumonia. Since we have been unable to find other mention of this condition as a complication or sequela of tonsillectomy, and because recovery from proven pneumococcus meningitis is rare, we are reporting the following case.

CASE RECORD

A pupil nurse, aged 25, was admitted to the Hospital of the American University of Beirut on Feb. 25th, 1926, for tonsillectomy. She had suffered from rheumatic heart disease since an attack of polyarticular rheumatism in 1913. In 1916 her tonsils were clipped (guillotine operation), but the stumps were grossly diseased, and she had continued to suffer from occasional sore-throats and exacerbations of joint pain. The tonsillar stumps were removed under local anaesthesia, and after six days of uneventful convalescence she was discharged with a normally healing throat.

On the same afternoon, March 3rd, she began to have headache which was not relieved by aspirin and phenacetin, and her temperature rose to 38° C. (100.4° F.). These symptoms persisted till March 6th when the temperature rose to 40° C. (104° F.) and she was admitted to the medical service complaining of extremely severe, bursting headache, diplopia, and projectile vomiting. On examination she was found to be drowsy, but could answer questions intelligently when aroused. There was slight ptosis of the right upper lid and the right external rectus muscle was weak, causing strabismus. The pupils were equal and reacted to light and in accommodation. Slight muscular twitchings were noted over the face. Except for a few whitish spots over the fauces the pharynx and the mouth were negative. There was no glandular enlargement. The area of cardiac dullness was increased and a loud, rough systolic murmur was present at the apex and transmitted to the axilla. The pulmonary second sound was accentuated. The lungs were negative. There was no abdominal tenderness or rigidity, and no organs were palpable. The abdominal reflexes were very brisk. The left knee-jerk was more active than the right. Kernig's sign was present and there was moderate stiffness of the neck. There was no Babinski reflex.

Lumbar puncture was done at once, turbid spinal fluid being obtained under considerable pressure. Polyvalent antimeningococcus serum was injected, 60 c.cm. intrathecally and 40 c.cm. intramuscularly. When examined the fluid showed a cell count of 540 leucocytes per c.mm.,

85 per cent. being polymorphonuclears and 15 per cent. lymphocytes. The globulin content was increased; the sugar reduced to 37.7 mg. per 100 c.cm. Smears revealed numerous encapsulated Gram-positive lanceolate diplococci, and on planting the fluid in various media organisms having all the cultural characteristics of the pneumococcus were grown. Unfortunately no serum was available for typing, but the bacteriological characteristics were not those of Type III.

For three days there was no change in the symptoms, the patient crying out almost constantly, owing to the unbearable headache. On March 8th another lumbar puncture was done, purulent fluid was drained off, and 20 c.cm. of polyvalent antipneumococcus serum was given intrathecally. The spinal fluid again contained pneumococci on smear and culture. Antipneumococcus serum, 20 c.cm., was given intramuscularly and on the following day 20 c.cm. of 1 per cent. Mercurochrome intravenously. A very severe reaction followed this last injection, the temperature rising to 41°C. (105.8°F.); the patient went into collapse. Next morning, the 10th, her symptoms were much improved. Lumbar puncture yielded 30 c.cm. of fairly clear fluid which was replaced by 20 c.cm. of antipneumococcus serum, another 20 c.cm. being given intramuscularly at the same time. Improvement continued, no further specific treatment was given, and except for urticaria which appeared on the 11th her progress to recovery was uneventful. She was discharged cured on March 25th, soon took up her duties in the training school and completed her course without further illness.

DISCUSSION

It has long been the consensus of medical opinion that the prognosis of meningitis due to the pneumococcus is extremely unfavourable if not hopeless. Schottmüller¹ reported 100 per cent. mortality in 100 cases, and more recently Davidson and Wollstein² have reported a series of 122 cases in children without a single recovery. Although admitting that some patients have recovered, Waterfield³ in a review of 24 fatal cases at Guy's Hospital is frankly sceptical concerning the diagnosis in the more than 150 "proven cases with recovery" collected from the literature by Goldstein and Goldstein⁴ in 1927. In many of these cases, and in a few presented since that time, insufficient data are given concerning the methods used in identification of the causative organism or, as in the case reported by Goldstein and in those of Croft,⁵ and of McAuley and Hilliard,⁶ no growth was obtained on culturing the spinal fluid, the diagnosis being based on the finding of organisms resembling the pneumococcus in stained smears. Nevertheless, in a not insignificant number of the older cases and in at least 17 of the more recent reports, the diagnosis was sufficiently established by bacteriological studies for the prognosis in future to be less gloomy.

In these 17 cases pneumococcus Type I. was found in three instances⁷; in two the organism was of Type III.⁸; in three of Group IV.⁹; and in the remainder¹⁰ the type was not noted. It would appear that when recovery has occurred the causative organism in most instances has belonged to a relatively avirulent strain of the pneumococcus. A review of the therapeutic measures employed suggests that the second important factor leading to recovery is the vis medicatrix naturæ.

Since antipneumococcus serum became available it has been employed in the treatment of many cases, occasionally with favourable outcome. Reveno and McLaughlin⁷ gave large doses of specific serum intrathecally and intravenously with favourable results in their case of Type I. pneumococcus meningitis. In the 9 other cases collected from the recent literature,¹¹ and in our own case, where antipneumococcus serum was used, its rôle in bringing

about recovery is open to question. In none of them was the serum known to be type-specific. In several cases very small doses were employed and the relationship between serum administration and clinical improvement is not clearly shown. Repeated lumbar puncture is another procedure which has been often carried out. In 9 of the 17 cases¹² referred to, it was the chief method of treatment. Combined cisternal and lumbar puncture and cisterno-lumbar irrigation with normal saline solution was done in two of them.

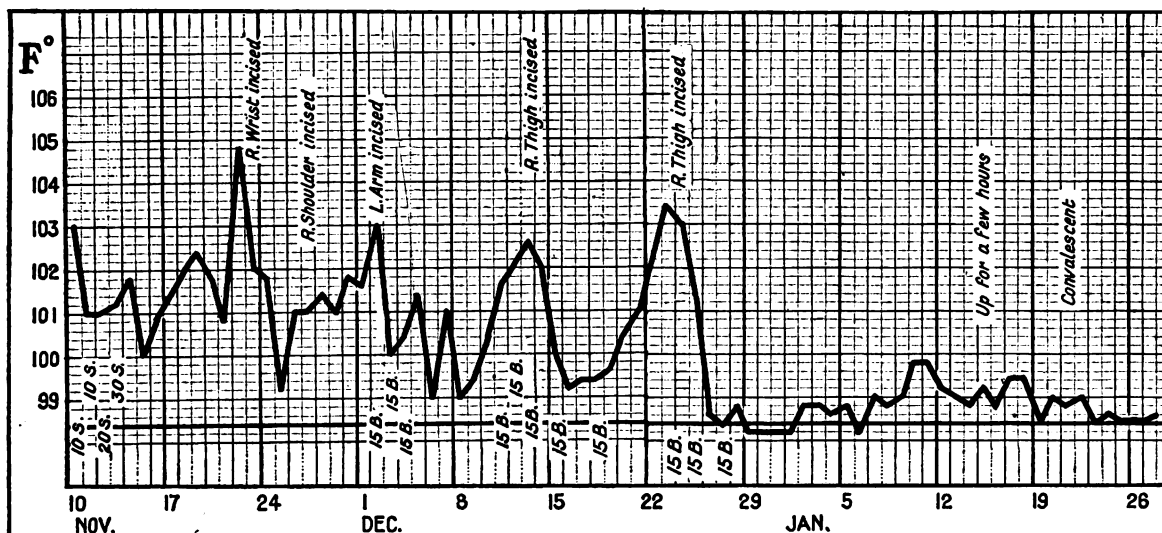
Other therapeutic measures which have been advocated have either failed in other hands to give the results suggested by their proponents or have not been accorded sufficient clinical trial for judgment to be passed upon their efficacy. Among these may be mentioned ethyl-hydrocupreine (Optochin Base) and its soluble hydrochloride which gave much promise experimentally and which have been widely used¹³; hexamine (urotropine), which Murphy¹⁰ gave to his patient in large doses and to which he thought the rapid relief of symptoms might be attributed; potassium permanganate solution, which was administered by Weinberg⁸ according to the Nott technique as almost the sole treatment.

Mercurochrome has not proved effective either experimentally or clinically against the pneumococcus. In a case reported by Stoessiger,¹⁴ in which Gram-positive diplococci resembling pneumococci were found in the spinal fluid, mercurochrome was given intraspinally, and the patient "was on the road to recovery" after the third injection. In his case as in ours a severe reaction with considerable rise in temperature resulted from the mercurochrome injection. It is interesting to speculate whether in both cases the shock and temperature elevation did not play a part in inducing the favourable outcome.

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EAST LANCASHIRE WORKPEOPLE'S HOSPITAL FUND. This fund is making excellent progress, for the cost of working is very small and the bank interest almost covers the expenses. Over £150 more is available for distribution than last year and the fund has been able to help several medical charities in Blackburn.



Temperature chart showing response to injections of antiserum (s) and whole blood (B). The figures before B and s indicate the number of cubic centimetres injected.

STREPTOCOCCAL SEPTICÆMIA TREATED WITH WHOLE-BLOOD INJECTIONS

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PATHOLOGIST TO THE HOSPITAL

MUCH has been written on the use of streptococcal antiserum in the treatment of septicæmia. On the whole the results have not been satisfactory, although in the treatment of puerperal sepsis Burt-White¹ reported successes and in two cases recorded by Pinnock and Sanguinetti² good results followed the use of streptococcal antitoxin.

Human blood-serum was used by Lazarus-Barlow and Blayney Chamberlain³ in the treatment of septicæmia and they report success in 9 out of 12 cases. They suggest the use of whole blood in place of serum, and we adopted this method in the present case because the patient was seriously ill and it seemed inadvisable to remove her to hospital. The procedure used was the injection of 15 c.cm. of whole blood taken from the patient's husband and its immediate injection into the thigh. No apparatus was required other than sterile needles and syringe; nor was blood-grouping necessary.

CASE RECORD (SEE CHART)

While nursing her only child, who had a sore-throat, Mrs. A., aged 30, developed tonsillitis which lasted two days. This was on Oct. 24th, 1934. A week later sore-throat again developed, and on Nov. 7th it became serious; when the patient was seen by one of us (J.A.H.) her temperature was 101°F. and her pulse-rate 120, the tonsils and pharynx looking shiny and red. On Nov. 10th she became delirious, with terrifying dreams at night. Red raised patches appeared on the left side of the forehead, the right supraclavicular region, the right upper arm, the right wrist, and the right thigh above the knee. There was general stiffness but no meningismus. The temperature was now 104°F. and the pulse-rate 140. A blood culture was taken and the urine examined, the latter being found to contain red blood-cells, slight excess of leucocytes, and an occasional cellular cast. Streptococcal antitoxin (10 c.cm.) was given, with a further 10 c.cm. next day when the blood culture showed a short-

chain streptococcus. The antihæmolytic titre of the serum was 75 units (maximum normal 50 units).

On Nov. 12th the condition remained serious. There were severe headaches, the red patches noted on the 10th were more pronounced; also there was apparent rigidity of the upper and lower limbs. Antitoxin (20 c.cm.) was again given, and a further 30 c.cm. on Nov. 13th. From the 14th–23rd there was no improvement. The patient became emaciated and depressed and lost appetite. Her heart was enlarged and there was a systolic mitral murmur. An abscess appeared over the right wrist and it was incised on Nov. 23rd, a culture being taken at the same time. This was found to contain hæmolytic streptococci, and they were sent to Dr. F. Griffith, of the Ministry of Health, who reported that the organism was of the Carter type. He mentioned that this type had been isolated in a family outbreak in which a child died of acute peritonitis following a labial infection, the mother finally recovering after severe cellulitis in the region of the breast. A vaccine was prepared from the streptococcus, the strength being 100 million per c.cm., and this was given to the patient's husband on alternate days until the dose was 100 million, the object being to give the patient an immuno-transfusion.

On Nov. 27th an abscess over the right shoulder was opened; pus poured freely from it. For a time the patient's condition improved, but it deteriorated on the 30th; the headaches returned and she became depressed and exhausted. On Dec. 2nd another abscess, on the left arm, was incised and the patient received the first injection of husband's blood (15 c.cm.). The same quantity was given next day, and at 2 p.m. the temperature was normal, the maximum evening temperature being 100°F. A further 15 c.cm. was given on the 4th; there was general improvement, and the patient was free from headaches and able to take more food. Progress was interrupted, however, on the 10th when the temperature rose to 104°F., and on the 11th the state of affairs was not satisfactory, the patient being restless and depressed. An injection of 15 c.cm. of whole blood was given and another next day, when the maximum temperature was 102°F. and redness and swelling were apparent above the right knee, with stiffness of the joint. Fluctuation was obtained above the right knee on the 13th and an incision was made, but no pus was found. Injections of blood (15 c.cm.) were again given on Dec. 13th, 15th, 18th, and 24th, and a further incision was made about the middle of the thigh on its inner side. On the 25th, when the patient received a further dose of blood, pus was discharging freely from right thigh and she felt much better. The last blood injection was given on the 27th, when improvement was fully maintained, and on the 28th all incisions

showed signs of healthy healing. The maximum temperature was 99° F.

From Dec. 28th onwards the patient made good progress and on Jan. 21st she was convalescent. When seen on April 27th after a stay in Ireland she had put on over a stone in weight and there were no signs of residual infection. The antihæmolysin titre had risen from 75 units at the onset of the infection to 250 units on April 27th.

Although in this case there was a slight fall in temperature after each injection of streptococcal antitoxin, there was little improvement clinically. This may have been due to the absence from the antiserum of the specific antibody corresponding to the bacterium infecting the patient. Each injection of whole blood from the donor immunised with an autogenous vaccine caused profound improvement, and they seemed to precipitate the formation of localising abscesses in the red patches which appeared at the onset of the illness. As the antihæmolysin titre of the serum increased only from 75 to 250 units it is doubtful whether any improvement can be attributed to the antihæmolysin. (It may be recalled that Todd⁴ in his work on the infection of mice by hæmolytic streptococcus found that no protection against infection was obtained by the use of antitoxin nor by the use of high-titred antihæmolysin; in all probability the improvement in some of the mice was due to a protective antibody at present unknown.) The possibility of complement cannot be neglected, for it has been found by Cadham⁵ that in acute infection the complement titre may be low during the acute phase of the disease. The introduction of complement by the way of whole blood from a healthy person may in this case have done much to combat the infecting organism.

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GROOVED ALUMINIUM VERSUS WOODEN SPLINTS

By A. P. BERTWISTLE, F.R.C.S. Edin.

THE materials used for splints by doctors in their own surgeries are amazing; I have seen folded newspaper, cardboard, and rough pieces of boxwood employed. Many hospitals use wooden splints, some fashioned, others not. The St. John Ambulance

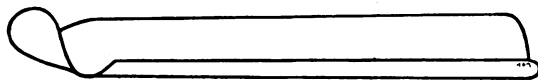


FIG. 1.—Jones's cock-up splint.

Brigade use straight wooden splints. I believe that if the advantages of grooved aluminium were more generally realised this would be the material of choice. Aluminium splints may be divided into two classes:—

1. *Emergency, home-made.*—Sheet aluminium, gauge 22, will be found to be the best, for it is sufficiently strong and yet is easily cut with tinsmith's shears, which are like massive scissors and readily procured. The requisite length is cut, sharp corners are removed, and the splint is guttered by hammering over a rounded object or even by hand. This guttering is imperative, since without it aluminium will bend under a slight strain. Half-inch adhesive plaster is fastened round the edges; this serves

to do away with rough edges and helps to steady the subsequent padding. Such splints are invaluable for special fractures—e.g., in small children. A stock should always be available.

2. *Rolled.*—These are greatly to be preferred, since the even rolling makes for increased strength. The tinsmith rolls them in his rollers so that the gutter forms an arc of a circle with a radius of 2 in., more or less; more in the case of splints of more than 2½ in. across and much less in the case of finger splints. The edges are covered with adhesive as before.

The following are the advantages claimed. (1) *Strength.* Experimentally a rolled tinsmith's splint 9 in. long by 2½ in. wide, of 22 gauge, suitable for

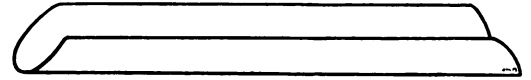


FIG. 2.—Forearm splint.

a forearm, supported at each end, withstood a weight of 112 lb. placed on its middle. Such strength is quite sufficient to cope with most of the stresses and strains to which the splint would be liable. An emergency splint broke down under half the weight. (2) *Economy.* The fashioned wooden splint—and no other wooden splint should be permitted—costs considerably more than the aluminium one. The Robert Jones cock-up splint, which is readily made by cutting out a section to accommodate the thenar eminence and turning the end backwards, costs much less than Carr's splint for Colles's fracture. (Incidentally, surely the dorsiflexed position is the proper one for Colles's fracture? The fragments showing little tendency to movement, the wrist is much stronger in that position than palmar-flexed, and the fingers can be freely moved.)



FIG. 3.—Splint for great toe.

(3) *Lightness and small bulk.* The aluminium splint has the double advantage of being more comfortable to the patient and of being easily stored. The two splints used for Colles's fracture weigh 6 oz., whereas two aluminium ones weigh 2 oz. and are stored in a fraction of the space, unpadded. (A few placed under the seat of a motor-car may on occasion be invaluable.) (4) *Asepsis.* Open fractures and those associated with wounds are liable to soil the splint, which should be discarded. Aluminium ones may be boiled. (5) *Radiolucency.* A fracture may be radiographed with the splint in situ.

Aluminium splints are ideal for fracture of the radius and ulna, the commonest bones to suffer. They are excellent for fractures of the digits, often allowing the patient to continue his work, as a clerk for example. In the case of the toes, especially the great one, the splint has to have a sole, and in practice needs changing weekly because it is liable to break if weight is borne. Aluminium splints may be used for fracture of the fibula, and are invaluable in the first-aid treatment of fractures of the tibia and fibula in children and adults and of the femur in children. In these days of motor accidents and X ray plants too little attention is paid to the all-important first-aid treatment of fractures.

ROYAL SOCIETY OF ARTS.—On Feb. 10th, 17th, and 24th Major-General Sir Robert McCarrison, late director of nutrition research, Indian Medical Research Fund Association, will give three Cantor lectures to the society (John-street, London, W.C.) at 8 p.m. He will speak on Nutrition and National Health.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF ORTHOPÆDICS

At a meeting of this section on Jan. 7th, with Mr. ALAN TODD in the chair, methods of treating

Club Feet and Pes Cavus

were illustrated by cinematograph films and by patients showing successful results. The first film, exhibited by Mr. DENIS BROWNE, detailed his method of treating congenital talipes in infants. He felt convinced that one class of deformity was due to mechanical intra-uterine forces. The most important from the point of view of the child's future was talipes equino-varus, which, he believed, was a moulding deformity due to pressure of the uterus on the outer side of the foot; the responsible single factor was the position of the foot in the uterus; a normal right foot took the pressure of the uterine wall on its sole. The essential part of the deformity was a twisting inwards of the fore part of the foot, which was forced round into the reverse position. In these cases there was also a thinning of the skin over the convexity of the foot. It was very important to treat this deformity in infancy, while the bones were soft and the tissues supple. After forcible manipulation to bring the foot beyond the normal position, the ankle was dorsiflexed and kept in position with strapping, and both feet were bandaged to one rigid foot-piece. This treatment restored muscle balance, and the vigorous kicking indulged in by the child showed the muscles to be in good working order; indeed this kicking was a very important factor in the treatment. A later stage was depicted with the splint removed and the foot in a normal position, with no tendency to revert to the abnormal. As soon as the child was able to walk it was made to stand up in the splints, and twice daily the foot was strongly dorsiflexed.

Mr. B. WHITCHURCH HOWELL congratulated Mr. Browne on his results, which represented a great advance in the treatment of club-foot. There was likely to be a difficulty if the method was carried out as a routine in outlying country districts, where after-care might be inadequate.

Mr. NAUGHTON DUNN (Birmingham) remarked that the series of results shown by Mr. Browne were extraordinarily good. This method of maintaining external rotation was the best he had seen, and, as it was simple, he considered it was more applicable to treatment in country places than other current methods. He stressed the importance of counterbalancing the corrective forces by equal pressure on the outer side of the neck of the bone, because, unless the operator exercised care in this respect, a rotation of the astragalus on the ankle-joint would obliterate the hollow in front of the external malleolus. The presence of this indicated true correction but in its absence a relapse was almost sure to follow. Another important point was that over-correction of the club-foot deformity might result in severe valgus deformity. It was essential first to secure over-correction and then a restoration of the muscle balance. It was a great advantage if, as Mr. Browne had said, it was unnecessary to elongate the tendo Achillis, but in some patients he himself had not found that the case. If the tendon was not fully stretched, the patient would be liable to have a permanent flat-foot. The surgeon must not maintain

over-correction too long, and he must be sure that the tendo Achillis was long enough to allow dorsiflexion in the position of inversion.

Mr. DENIS BROWNE replied that cutting the tendo Achillis was, in his opinion, a crippling and deforming procedure.

The CHAIRMAN demonstrated by means of a film his operation for the treatment of pes cavus, the results of which were shown to be excellent. He explained that, although he worked at and evolved the procedure independently, he did not claim for it any originality.

Clinical Cases

Mr. C. LAMBRINUDI showed two lantern slides of a case of osteochondritis of the outer condyle of the femur. The patient, a woman aged 70 years, had fallen down and hurt the inside of her knee. Shortly afterwards a swelling appeared there which remained localised, and she had since suffered a good deal of pain. She had sought advice at several places, but not until the exhibitor saw her was a skiagram taken. Both flexion and extension were preserved, and no extra heat could be detected in the part. She was definitely better after a short time in bed.

After describing the good result from fascial repair of a torn ligamentum patellæ in a boy aged 17, Mr. ROOYN JONES showed a case for diagnosis. The patient, a man aged 57, and seen that day for the first time, occupied himself in slaughtering diseased animals. Some weeks before, following a scratch, his finger had become swollen and the swelling had persisted and increased. It was not tender, but the tendon sheath felt boggy; movement of the metacarpo-phalangeal joint was limited. The bone did not show any suggestion of a pathological condition.

Mr. V. H. ELLIS suggested that the condition was a tuberculous infection, which was common among those engaged in animal slaughter. It was probably a tuberculous teno-synovitis and should be immobilised in plaster for a time to see what happened.

The CHAIRMAN did not regard the condition as tuberculous, but probably an anaerobic infection of low virulence. He suggested puncture, and an attempt to cultivate the material obtained on both anaerobic and aerobic media.

Mr. C. HOPE CARLTON also thought it was not tuberculous but he would hesitate to puncture it. That kind of low-grade infection in the fingers was not uncommonly seen in industrial areas, and the outlook, he thought, was bad. Some form of high temperature treatment and radiant heat could be tried, but even then the prospect of retaining the finger was poor.

Mr. DUNN said he was not sure whether this was a tuberculous condition or a low-grade infection, but he had treated a similar condition in a butcher. The sheath was exposed and there was a general synovial thickening, which was removed surgically, and the result was good. It would be a waste of time to immobilise a finger in a man who was eager to resume work; amputation would be best in the case of recurrence.

Mr. E. P. BROCKMAN also showed as a case for diagnosis a man, aged 60, who in 1929 had complained of pain in the hip-joint, and, a year later, arthritis was present in the joint. He did a Rickman's reconstruction and found only osteo-arthritis with some pedunculated folds in the synovial

membrane. The man said that in 1915 he had had a cyst removed from the hip-joint. No tubercle had been found. Last year the man could not walk so well, his pain had become greater and at length persistent, and a lump was noticed. Bearing in mind the man's age and the absence of remissions in the pain, he thought it was likely to be a case of sarcoma.

Mr. DUNN diagnosed an ossifying chondroma, the pain being probably due to a stretching of the sciatic nerve over the bone. The best treatment was to expose the area and remove the tumour for pathological investigation.

ROYAL ACADEMY OF MEDICINE IN IRELAND

At a recent meeting of the section of surgery, with the president, Mr. SETON PRINGLE, in the chair, Mr. A. B. CLERY read a paper on the

Enucleation of Pleural Adhesions by Open Operation

This operation, he said, was particularly indicated in patients with one or two apical adhesions extending into the region of the subclavian vessels. The skin incision was as for an upper thoracoplasty, the deeper muscles being divided in the line of the third rib. Having retracted the scapula, 2½ to 3 inches of the rib were resected, and the pleura opened by diathermy. Light-bearing retractors were introduced into the pleural cavity and the adhesions enucleated from their attachment to the parietal pleura by the diathermy needle under direct vision.

Dr. G. T. O'BRIEN described the clinical course of three patients upon whom this operation had been carried out. In two of them the sputum, previously

T.B. positive, was negative within a fortnight of the operation, and cavities had closed in six weeks. In the third case laterally directed adhesions were enucleated, but infiltration of tissue by tubercles about the subclavian vessels prevented the lung apex from being freed. The cavity in this case had diminished in size. Treatment by artificial pneumothorax had been continued in all three cases.

Mr. F. J. HENRY thought there was scope for preliminary thoracoscopy in these cases, as some of the adhesions might be suitable for closed division. He drew attention to the necessity for air-tight closure of the wound, or the pneumothorax might become incompetent by leakage, the lung re-expand, and the adhesion become reattached. To prevent this, it might be well to suture the cuff of enucleated pleura over the raw stump of the adhesion.

Mr. T. A. BOUCHIER-HAYES referred to two cases he had treated in a similar manner, one of which, in whom the third and fourth ribs were resected, developed surgical emphysema:

Dr. J. B. MAGENNIS, while agreeing that the method afforded a new way of dealing with adhesions which could not be dealt with by thoracoscopy, thought it would be wise to do a preliminary thoracoscopy. There was, he felt, a definite danger of surgical emphysema.

Mr. CLERY, in reply, said he did not decry the value of thoracoscopy; he wanted to show that the open operation could be done if necessary. Surgical emphysema, he thought, would not be a serious complication.

Dr. R. STUMPF read a communication on a new method of low-voltage X ray therapy for easily accessible cancers, known as Chaoul's contact treatment. Of 35 cases in which the treatment was completed, 25 cases were clinically healed.

REVIEWS AND NOTICES OF BOOKS

Body Water—the Exchange of Fluids in Man

By JOHN P. PETERS, M.D., Professor of Internal Medicine, Yale University School of Medicine. London: Baillière, Tindall and Cox. 1935. Pp. 405. 18s.

WATER is so close to the roots of life that there is no branch of medical or physiological research where the investigator does not sooner or later encounter problems involving some insight into fluid metabolism. While it seems that certain aspects of the subject, such as the impermeability of the cell membrane to the potassium ion, are likely to remain inscrutable as long as life remains undefined, a great deal of useful information has accumulated about less obscure questions. Anyone who attempted to survey comprehensively the spate of papers on water metabolism which flows in ever-swelling volume through the channels of the biological press could only produce the type of review which exacts the epithet "monumental," and, being essentially lifeless, earns it. Interminable catalogues of conflicting conclusions and opinions, punctuated by strings of surnames in unlovely juxtaposition, and unleavened by critical comment, dismay rather than help the reader. Prof. Peters has avoided this danger and has somehow succeeded in weaving the 900 odd items of his bibliography into an intelligible argument.

He has concerned himself in the earlier chapters with the transfers of fluid which are continually

occurring between the various compartments of the body: from blood-vessel to interstitial space, to serous or joint cavity, to subarachnoid space; from interstitial space to lymphatic, from plasma to corpuscles, and so on. He attempts to explain these movements in terms of certain physical and physiological postulates, like the Donnan theory of membrane equilibrium and the Starling theory of the formation of interstitial fluid. It is a difficult task, for hydrostatic principles and collodion membranes are simple compared with hydrodynamics and membranes of varying permeability, but Prof. Peters handles his bulky data well. One or two minor points call for criticism. There is a school which clings to the odd belief that the intercellular spaces are filled with a protein gel, a sort of sponge which soaks up or exudes fluid in response to changes in hydrogen-ion concentration. In recoiling from this untenable hypothesis the author goes too far and implies that the immediate environment of the cell is wholly saline and circulating. But something tangible must also be present to maintain the architectural integrity of tissue, and whether that something is the mucinous ground substance of the older histologists, or the reticulum of more modern writers, there is certainly a fixed, as well as a circulating component in the environment of the cell, and the physiologist will sooner or later have to take it into consideration. Again, in discussing synovial fluid Prof. Peters finds great difficulty in accounting for the presence of mucoprotein. He is evidently not

alone in this difficulty, for he quotes attempts which have been made (of course unsuccessfully) to discover mucous secreting glands in synovial tissue. Surely it is well enough established that mucoprotein is a normal constituent of most tissues.

In a later chapter Prof. Peters considers the various ways by which the body gains or loses water, an important subject if only in view of recent attempts to make the measurement of water exchange a practical clinical proposition. The technical difficulties and possible sources of error in what to the uninitiated may appear a simple procedure are discussed at some length, and the reader is left with the feeling that for ordinary purposes measurement of fluid intake, urine output, and body-weight, however unscientific, remains at present the only practicable way of deciding whether a patient is gaining or losing water. The latter, and perhaps the more valuable half of the book, is devoted to a consideration of the physiology of the secretion of urine, and forms an up-to-date and readable review of this most difficult subject.

Prof. Peters's book is not likely to appeal to the general reader, but the physiologist or clinician whose researches have brought him unexpectedly to the shore of fluid metabolism would be well advised to consult it. It should at any rate save him from drowning in a sea of irrelevant references.

Aids to Medicine

Fifth edition. By JAMES L. LIVINGSTONE, Physician to King's College Hospital; Assistant Physician to the Hospital for Consumption and Diseases of the Chest, Brompton. London: Baillière, Tindall and Cox. 1935. Pp. 422. 5s.

AN eastern potentate commanded his wise men to write the history of his people, but rejected their work because it was too long; they abridged it again and again, and finally satisfied him on his death-bed with the version, "They lived; they suffered; they died." Medicine has not yet been compressed quite so far, but in Dr. Livingstone's "Aids" it is reduced to remarkably small compass. The fifth edition has been brought up to date, and is based, as may be inferred from the preface, on Price's textbook and Tidy's Synopsis. The summarising is well done, and the text is clear, easily read, and quickly grasped; if the student needs to swallow his medicine in pill form just before his examination this is no doubt an excellent pill—perhaps the best, with one notable exception, and that is a summary made by the student himself. To condemn the "aids" altogether is admittedly a counsel of perfection, but it is to be hoped that many of our students are intelligent enough, well enough taught, and wisely enough examined to be able to dispense with them.

Early Diagnosis of the Acute Abdomen

Seventh edition. By ZACHARY COPE, B.A., M.D., M.S. Lond., F.R.C.S. Eng., Surgeon to St. Mary's Hospital, Paddington; Senior Surgeon to the Bolingbroke Hospital. London: Humphrey Milford, Oxford University Press. 1935. Pp. 254. 10s. 6d.

THIS book is already well known. Changing conditions have called for alterations in the text, and it is likely that in time further modifications will be required, especially in the chapters dealing with intestinal obstruction. It is questionable, for instance, whether the statistics from St. Mary's Hospital, showing that out of 300 cases of acute obstruction 177 were cases of strangulated hernia, give a true

picture of the present incidence of strangulation now that radical operations for hernia are more frequently performed before the onset of complications. It is also to be noted that in this book, which is distinguished by the clearness and soundness of most of its teaching, the account of intussusception should be rather unconvincing and out of harmony with present day views on this condition. Mr. Cope's work records the fruits of careful clinical study, and herein lies its excellence. The introduction of more elaborate methods of examination seems rather to detract from its value. For example, it is doubtful whether it is sound to regard the use of radiography as an advance in the early diagnosis of intestinal obstruction, and it is surely a mistake to suggest that cystoscopy should be undertaken to diagnose rupture of the bladder. Insufficient stress is laid upon the value of auscultation in the investigation of cases of acute intestinal obstruction, and more detailed consideration might well have been given to rupture of the spleen. These criticisms on matters of detail are made in the confident belief that many further editions of this valuable monograph will be called for.

Healing: Pagan and Christian

By GEORGE GORDON DAWSON, M.A., B.D. Camb. London: Society for Promoting Christian Knowledge. 1935. Pp. 322. 9s.

IN this book the author attempts to consider in a comprehensive manner the principles of therapeutics; he finds the restoration of health to occur through the three avenues of the body, mind, and spirit, and labels the usual treatment of the sick as departmental. It follows that arguments are set out for religious healing as distinct from therapeutic treatment, and for coöperation between the pastor and the physician in effecting cures. The first part of the book surveys the very earliest conceptions of disease and death, reviewing the art of healing as displayed by the ancient civilisations and by primitive doctors. This brings us along a well-worn track through the medicine of the Greeks and Romans to the Christian era, so leading to the chapters dealing with the methods of healing associated with the Christian Church. Here proper stress is laid upon the value of monkish learning, and although there is not much to be said in this connexion which is not familiar to those who are at all well read, the material is set out in an easily assimilable form for the uninformed. But presumably the book was written largely to promote the views, as expressed in the closing sections, on mental and spiritual healing, and because these views are clearly set out we recommend them to attention. The medical profession is more ready to listen sympathetically to evidence pointing to the value of religious healing than the church appears to know.

Félix Lejars: Traité de Chirurgie D'urgence

Ninth edition. By PIERRE BROcq, Professeur agrégé à la Faculté de Médecine de Paris; Chirurgien des Hôpitaux. Assisted by ROBERT CHABRUT, Ancien Chef de Clinique à la Faculté de Médecine de Paris. In two volumes. Paris: Masson et Cie. 1936. Pp. 1299. Fr.200.

THE last edition of this book appeared in 1921. It was popular because of the simple and clear way in which every problem was tackled and explained, and because the recommendations were so obviously the fruit of the experience of a master surgeon. The

scope is a little different from that of any treatise on emergency surgery we have available in this country. It is more comprehensive, including many affections which are not immediately urgent in the strict sense of the word, and is the more valuable for its wider appeal. The book is addressed to the practitioner as well as to the young hospital surgeon. Emergency operations in every branch of surgery including the female genital organs, the ear, the eye, and the nose are described. The use of the œsophago-scope is recommended though its technique is not given; neither for that matter is that of the cystoscope and the urethro-scope. These methods are evidently considered too specialised for those to whom the book is primarily addressed. But it is not only practitioners and junior surgeons who will find it useful. It should be on the shelves of every operating surgeon, and easily accessible, for precise instructions are given for the treatment of emergencies seldom encountered apart from war, such as stab wounds involving the large vessels at the root of the neck, and rare emergencies, such as strangulated obturator and sciatic herniæ. The new authors have carried out an extensive revision of the work, have added much new matter, and have succeeded admirably in preserving its attractive character.

The Nelson Loose-Leaf Living Surgery

Renewal pages. Vol. III. *Orthopædic Surgery*. New York: Thomas Nelson and Sons. 1935. Pp. 179.

THE most recent renewal pages to reach us of this composite surgery are really the first instalment of a revised and enlarged section on orthopædic surgery. The death of the former author, Nathaniel Allison, has necessitated the appointment of a new editor, R. K. Ghormley, who has called to his aid a number of experts in the different branches of orthopædic surgery. This gives a very individual character to the subsections, and the teaching in some places differs materially from that of British surgeons. Thus the only treatment of spinal caries seriously considered is a bone-fusing operation; in the treatment of congenital torticollis division of the upper end of the sternomastoid is recommended, whilst the contraction of the cervical fascia and scalenus anticus as component factors is ignored. Such deviations from current practice in this country, however, make the volume the more valuable to British surgeons. There is an attractive chapter on malacic disease of bone and another on degenerative diseases of the spine, where the pathology of the intervertebral discs receives due notice. The growing feeling against violent measures in the correction of congenital talipes equino-varus is well expressed in an informative article. These examples are mentioned to show that the work is being kept well abreast of current thought, and the publishers and editors must once more be congratulated on maintaining the high ideal of service envisaged at the inception of this novel system of text-book construction.

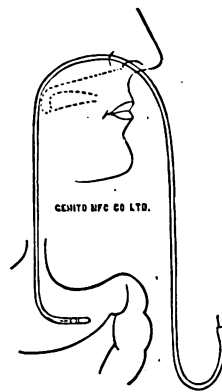
British Journal of Children's Diseases

IN the October-December issue (vol. xxxii.) Dr. E. Ashworth Underwood concludes his article on the Neurological Complications of Varicella with a general discussion on pathogenesis. A bibliography of 186 references is appended together with a list of 120 cases collected from the literature from 1873 to 1935, including an original case of cerebellar ataxia in a girl of 8.—In the concluding part of his Analysis of over Four Thousand Cases of Educational

Deafness Studied during the Past Twenty-five Years, Mr. Macleod Yearsley maintains that the education of the deaf must be based not on the considerations of different systems but on the study of the deaf child as an individual. According to his scheme of classification, which is based on school medical inspection, deaf children fall into four groups: the slightly deaf, the semi-deaf, the very deaf, and the defective deaf, without there being an absolute line of demarcation between the groups. He is opposed to residential deaf schools, except where they are necessary to serve large areas without day deaf schools, and is pessimistic as regards the general condition of deaf education in this country and its future prospects. He recommends that fresh legislation of a wide nature should be started without delay by an Act which would embody the necessity for early detection of deafness, education of the deaf from pre-school to post-school age, and training and employment.—Dr. J. W. Healy contributes a paper on Diabetes Insipidus as a Manifestation of General Miliary Tuberculosis. The patient was a male child aged 2½ years in whom the cause of death was acute external hydrocephalus and acute tuberculous meningo-encephalitis, the terminal phenomenon of a tuberculous infection of much longer duration. An intercurrent attack of diphtheria was a subsidiary contributing factor. The fact that diabetes insipidus appeared before other symptoms and that pituitary diseases had progressed to a greater extent than the tuberculous lesions elsewhere suggested that the onset of the syndrome corresponded with the commencement of tuberculous infiltration of the pituitary.—The abstracts from current literature are devoted to nervous and mental diseases.

NEW INVENTIONS

A TUBE FOR CONTINUOUS GASTRIC ASPIRATION

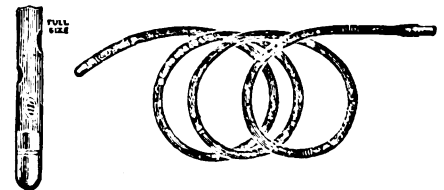


CONTINUOUS aspiration of the stomach is a valuable form of therapeutics in such conditions as intestinal obstruction, acute dilatation of the stomach, vomiting after gastric operations, and persistent vomiting of pregnancy. When the tube is introduced by way of the nasal route it can be left in situ for many hours. The patient can drink as he pleases and this, as well as satisfying his thirst, helps to wash out his stomach. If one nostril and the back of the throat are cocainised the tube can be introduced almost without discomfort. The tube

illustrated is designed for this purpose. The spring within its terminal portion so stiffens it that the nose can be catheterised easily. The end of the tube is seen at the back of the pharynx, where it is grasped by a long hæmostat, which is used to milk the tube down the œsophagus.

The tube is made by the Genito-Urinary Manufacturing Co., Ltd., and is supplied in two sizes.

HAMILTON BAILEY, F.R.C.S. Eng.



THE LANCET

LONDON: SATURDAY, JANUARY 18, 1936

A FORWARD MOVE IN EDUCATION

THE history of the school medical service is one of gradual expansion from the routine inspection of children at certain set periods of their school life to a fairly comprehensive system of care and treatment in clinics, hospitals, and special schools. Its development was noticeably rapid in the early years after the war, but the depression of recent years has caused some retardation in the rate of advance. In spite of the vigorous support which nursery schools have received, especially from women's organisations, remarkably little provision of this kind has been made, and some of the other special services are only a little less inadequate in many areas. The Board of Education now lays stress upon the need for a forward policy on the part of local authorities,¹ and as these are still grant-earning services, unaffected by the introduction of a block grant by the Local Government Act, 1929, it is likely that those authorities whose finances are not crippled by the burden of public assistance will respond. Attention is drawn to the fact that the dental service is seriously incomplete in most parts of the country. In order to afford sufficient dental care it is estimated that one dentist is required for every 5000 urban, or 4000 rural, children. School dentists fall notoriously short of this number, and many children cannot receive attention without prolonged and harmful delay. At the same time it must be remembered that this service has hardly touched the fundamental problem of the prevention of dental caries. There is urgent need for confirmation and extension of the work of Mrs. MELLANBY and others on the relation between dietary and caries. Part of the expansion of school dentistry might be avoided if we were sure of our facts and were therefore able to devote more energy to the education of mothers and children in the prophylaxis of dental decay. Unfortunately we are not yet in a position to put simple and incontrovertible information on the subject before the public, and until agreement has been reached among research workers we must depend upon conservative dentistry to ensure that the children leave school with healthy mouths, at least, if not with perfect teeth.

It is disconcerting to learn that the children under 70 authorities are still without provision for the prevention and correction of crippling defects. This is a straightforward problem, and, although the cost of such schemes per case may be high, the actual number of cases in any area is

comparatively small. Institutions and skilled personnel are available so that local difficulties should be easily surmounted. As to acute rheumatism, the grave cardiac sequelæ of which are emphasised in the Board's circular, there may be some difference of opinion about the most suitable type of provision. The modern treatment of early carditis requires practically the same sort of immobilisation as is practised in diphtheria, and this can rarely be obtained except in hospital. Fortunately the number of patients at any one time is not great, but they are better isolated from children suffering from other diseases, subjected to a reasonable open-air régime and mentally employed as in open-air schools. Wards set apart in general or fever hospitals may serve the purpose, but there is much to be said for quite separate institutions with attractive grounds. These institutions are still small, and experience shows that they need not be costly to run. Day and residential schools, both for the physically defective and the mentally subnormal, have not been developed to the extent which their established value might have led us to expect. A forward policy is now recommended by the Board. It is perhaps significant that no mention is made of special classes in ordinary schools for mentally subnormal children. This type of provision has been advocated, for rural areas at least, but it would appear that the Board's advisers prefer residential schools, if necessary under joint management. We should like to be sure that special classes have proved a failure before the more expensive alternative is adopted for every type of mentally subnormal child. In contrast, it appears to be left largely to local discretion whether children under 5 years of age, for whom authorities are now urged to make accommodation, should be received into specially constructed nursery schools or into modified parts of existing schools. When it is remembered that health, cleanliness, nourishment, and character training are the first requisites for these young children, and that few existing schools are capable of being suitably modified for the purpose, the case for ad-hoc schools seems overwhelming. Other recommendations of the Board, for instance, that special classes in ordinary schools should be provided for the partially sighted and the hard of hearing, and that the curriculum should be reorganised on the lines of the Hadow report, and, above all, the prospective raising of the school age, will place sufficient strain on the existing schools and their capacity for structural modification. A circular which is promised on the subject of physical education may make still further demands on both the internal and playground space of schools, so that it may be found more practicable to provide such facilities as those required for the younger group of children in totally separate buildings.

Education authorities are faced with a very complicated problem. School buildings are costly. Rightly or wrongly, they are solidly built to last for many years. Changing ideas in education tend to make their planning obsolete while their structure is still sound. The child population is declining,

¹ Board of Education: Circular 1444, Jan. 6th, 1936. H.M. Stationery Office. 2d.

and will soon fall rapidly, so that an inclination to avoid new construction for new types of provision is natural. Many schools, however, are unhygienic and cannot be modernised. While the prospective fall in the demand for accommodation must be kept in mind, it should not be allowed to influence too much the policy of local authorities in regard to the new or better types of service they are now being encouraged to give.

DILATATION OF THE URETERS IN PREGNANCY

It has long been known that the ureters and renal pelves tend to dilate during pregnancy, and this tendency is clearly of fundamental importance in the aetiology of pregnancy pyelitis. An obvious anatomical cause of the dilatation is the pressure of the gravid uterus on the ureters as they cross the pelvic brim, and for many years such pressure was held to explain the changes found. But the newer knowledge gained by modern urological methods has led to the suggestion that it is due to an atony of the ureters caused by some chemical substance circulating in the blood stream.

Dr. DUGALD BAIRD, of Glasgow, has made an extensive study of the changes in the upper urinary tract during pregnancy and the puerperium, and the results of six years' careful clinical research are at present being published.¹ He has approached the problem from both the anatomical and the functional side, for he has examined much post-mortem material and made many investigations on the living subject not only by intravenous pyelography and chromocystoscopy but also with an ingenious apparatus for measuring the tone of the ureteric musculature. His results, and also those obtained at the Johns Hopkins University,² demonstrate two factors in the dilatation of the ureters. That pressure by itself can bring about dilatation is shown by pyelograms taken in cases of pelvic cellulitis, ovarian cysts, and fibroids (though here it is never so advanced as during pregnancy); moreover, it is only anatomical differences that can account for the more frequent dilatation of the right ureter. Studies of the ureteric tone, however, show equally conclusively that during pregnancy the ureters become atonic: uterine pressure, when present, causes no compensatory hypertrophy or hypertonus; the ureter just stretches. Atony develops very early in gestation and is probably the cause of the early dilatation sometimes seen, though as a rule the pressure of the uterus on the atonic ureter is the deciding factor. One other possible cause also calls for consideration. At the lower end of the ureter there is a well-developed sheath of fibrous tissue and longitudinal muscle bundles, and it has been noticed that during pregnancy this sheath hypertrophies—so much so that the dilatation of the ureters has been ascribed to

hypertrophy of the muscle in the ureteric sheath, though the changes in the rest of the ureter are not those usually associated with obstruction at the outlet. The workers at Johns Hopkins University lay some stress on this hypertrophy, which they regard as hormonal in origin. They have found similar, though less conspicuous, changes throughout the urinary tract and suggest that oestrin, which is known to produce hypertrophy, oedema, and increased vascularity of the generative tract, might bring about similar changes in the urinary tract, since the two are derived from the same embryonic structures. The exact distribution of the epithelium which is specifically sensitive to oestrin is discussed by Dr. ZUCKERMAN in our present issue, with special reference to enlargement of the prostate.

The results reported by Mr. HAROLD BURROWS at the November meeting of the section of comparative medicine of the Royal Society of Medicine are all the more interesting in the light of this recent work. He has been studying the effects of the prolonged administration of oestrogenic substances to mice, and in addition to other remarkable phenomena already reported³ he has noticed that after several months the urinary tracts of the mice become grossly dilated and that purulent cystitis and pyelitis sometimes follow. LACASSAGNE⁴ and BURROWS originally ascribed these changes to urethral obstruction caused in the female by the keratin debris in the vagina, and in the male by the enlargement of the accessory genital glands. After further experiment on male mice, however, BURROWS now thinks they may be due to failure of the nervous or chemical control of the neuromuscular apparatus of urination; for he could find no definite urethral obstruction, despite the enlarged accessory glands and the keratinisation of the urethral mucous membrane. Those who were fortunate enough to see the specimens he demonstrated could not but be impressed by the large dilated ureters and the hydronephroses, and it is hard to resist the conclusion that there is some connexion between these findings and the ureteric dilatation seen in pregnancy, especially since it is known that large amounts of oestrogenic substances are excreted in the urine of pregnant women. On the other hand, the dilatation in mice was obtained only after administration of the oestrogens over periods far longer than the normal period of gestation in the mouse, and MENGERT⁵ has shown that the ureters of the cow, pig, macacus monkey, dog, cat, rabbit, guinea-pig, and rat do not dilate in pregnancy. BURROWS has demonstrated very clearly yet another property of the oestrogenic compounds, but in our present state of knowledge it would not be safe to draw general conclusions from effects observed in one animal.

Other experimental work, moreover, lends little support to the idea that oestrin is responsible for

¹ Baird, D.: *Jour. Obst. and Gyn. Brit. Emp.*, 1935, xlii., 577 and 733.

² Hundley, J. M., Jun., Walton, H. J., Hibbitts, J. T., Siegel, I. A., and Bruck, C. B.: *Amer. Jour. Obst. and Gyn.*, November, 1935, p. 625.

³ Burrows, H.: *Brit. Jour. Surg.*, 1934, xxi., 507; *Amer. Jour. Cancer*, 1935, xxxiii., 490; *Jour. of Physiol.*, 1935, lxxxv., 159.

⁴ Lacassagne, A.: *Compt. rend. Soc. de biol.*, 1933, cxliii., 590.

⁵ Mengert, W. F.: *Amer. Jour. Obst. and Gyn.*, 1934, xxvii., 544.

ureteric dilatation in pregnant women. According to the current theory of the hormonal control of pregnancy, œstrin makes the uterus sensitive to the oxytocic principle of the posterior pituitary, increasing its tone, while the corpus luteum hormone (progesterin) renders it refractory and thus decreases its tone. In the first half of pregnancy the corpus luteum is dominant and the uterus is atonic; then the influence of progesterin gradually wanes while that of œstrin waxes and the uterine tone consequently increases. It is noteworthy that BAIRD finds a similar sequence in the human ureteric musculature, the tone of which also increases towards the end of pregnancy. In our own columns last year it was shown⁶ that during the greater part of pregnancy the œstrin excreted in the urine was mostly present in a "combined" form of low physiological potency, and that it becomes active only with the approach of full term. It seems reasonable to suppose that it is the presence of the active œstrin excreted with the approach of full term that makes the uterine muscle highly sensitive to pituitrin and so leads to the expulsion of the fœtus. According to these views it is the corpus luteum hormone (progesterin), and not œstrin, which one would expect to cause dilatation of the ureters; and, in fact, progesterin has generally been regarded as responsible for their atony during pregnancy.

THE GERSON DIET

It is now more than ten years since Dr. MAX GERSON, then a general practitioner in Westphalia, introduced a special salt-free diet for the treatment of tuberculosis and other chronic diseases affecting the general nutrition of the body. The origin of the treatment is of some interest, for it arose out of a personal experience. Fifteen years earlier, when GERSON was working in a hospital in Berlin, he made some experiments to see if a change in diet would cure the attacks of migraine from which he then suffered. Finding success from the elimination of salt, he tried the same thing on other people and was profoundly impressed by the results. It was the incidental recovery from lupus of a patient treated for migraine on this dietary that led to its trial in tuberculosis. The diet as modified by Dr. A. HERRMANNSDORFER, assistant to Prof. E. SAUERBRUCH, was extensively used in the treatment of patients with bone and joint tuberculosis at the Charité in Berlin. The essential feature of this modified diet was the large proportion of albumin and fat, with little carbohydrate and no common salt, the principal ingredients being unsalted butter, raw and cooked fruit, salad, steamed vegetables, meal and flour, eggs, pudding, unshelled rice, sugar, nectar, olive oil, and dripping. The Berlin Medical Society discussed the treatment in August, 1929,⁷ when the Giessen clinic reported success with lupus and it has since been tried at a number of sanatoria and special centres. But GERSON himself soon

came to feel that his followers were too willing to compromise with patients loth to renounce all the pleasures of the table at one swoop. The Gerson-Sauerbruch-Herrmannsdorfer diet may have been, and probably was, a model of culinary diplomacy, but GERSON himself scented heresy and would have none of it. What may have widened the breach between the two was GERSON'S growing conviction that his diet, modified to meet individual needs, was capable of curing an increasingly wide range of diseases from rheumatoid arthritis to gastric ulcer.

The true gospel of the Gerson diet is set out by its originator in a monograph of more than 600 pages, most of which, despite the title,⁸ deal with the diet and its modifications. The author believes that his diet will induce healing of pulmonary tuberculosis even in advanced cases provided that sufficient functioning lung tissue remains, that the patient's general condition is not too bad for him to take the diet, and that complications such as lardaceous disease are not present. But he insists that success depends on scrupulous observance of details which require nearly a hundred pages of close type to set out, although the scheme of the whole course is given on a single page (305) of the book. In Germany or Austria the cost of the diet is not much above that of an ordinary sanatorium menu; Dr. GERSON does not give the actual figures; presumably the cost must vary with the prices of the constituents in different areas. More than half the book is devoted to protocols of 25 cases, treated at the diet station of the Urban Hospital in Berlin under the direction of Prof. HERMANN ZONDEK, and of 26 cases treated later by the author in Austria. These protocols include radiograms, blood counts, and other details of progress, which can be assessed for what they are worth by those who have experience of such cases elsewhere. GERSON himself briefly summarises the story of the earlier series which with one exception belonged to the working classes, some of them being unemployed. In about half there was some family disposition to tubercle and of these all except one had some complication which made a favourable issue less probable. Two-thirds of the patients were between 18 and 35 years of age. They were under GERSON'S personal care for a period of only three to eleven months and he admits with regret that he was prevented from seeing the treatment through to the end; but of 19 whose treatment went on for another two or three months after he left the diet station he had news, although he expresses a doubt whether the treatment was carried on after his departure as correctly as it was when he was there. But he warmly thanks the nurses and cooks of the Urban centre for their untiring help in carrying out the treatment which had met with less difficulty there than elsewhere; two or three of the patients received constant attention both by day and by night. In no case did they find the diet irksome at the outset, but later three of

⁶ Cohen, S. L., Marrian, G. F., and Watson, M.: THE LANCET, 1935, i., 674. ⁷ See THE LANCET, 1929, ii., 404.

⁸ Diättherapie der Lungentuberkulose. Leipzig and Vienna: Franz Deuticke. Pp. 619. M.36.

them refused suddenly to go on with it; in one or two cases there was wilful transgression and one patient succeeded in nullifying the treatment by getting relatives to smuggle food in. But 22 of the 25 went through the course without complaint, and although they were all suffering from advanced tuberculosis, of which the prognosis under ordinary conditions was bad, none of them died within the first year. GERSON submitted his X ray records to Dr. FELIX FLEISCHNER, radiologist in Vienna, who formed the independent opinion that 24 out of the 25 were on the way to complete recovery.

Unfortunately this remarkable experience did not secure GERSON'S tenancy of the diet centre and he was obliged to continue his work at an Austrian hospital where he collected what seemed to the outsider an odd assortment of morbid changes. Not the least interesting of the cases were patients suffering from advanced rheumatoid arthritis who had come to him on the recommendation of some sufferer to whom the diet had brought relief. But here again GERSON was unable to continue his régime long enough to carry con-

viction to his professional colleagues and his success must be taken rather as a tribute to his personal qualities than as an indication that the treatment can be carried out widely. It seems that many physicians who have prescribed the diet have found patients rebel against its austerity, not least members of GERSON'S own race; they simply will not play the game when put on any rigorous diet, but eat all sorts of things surreptitiously. This must make an almost insuperable obstacle to carrying out GERSON'S precepts in any hospital which can be called voluntary. There is another possible reason for GERSON'S success which cannot be repeated outside Central Europe. Many of the people with whom he was dealing may reasonably be expected to have been in the habit of eating much salt pork, salt fish, and similar viands; any diet which corrected this national predilection was bound to achieve a certain amount of success. That is one reason why we may watch with interest a continuance of the experiment in a Paris suburb where GERSON is now with the help of friends and grateful patients running a special clinic.

ANNOTATIONS

SURPLUS AND DEFICIT

THIS is addressed less to our readers than to their wives and families, and we ask that it should be referred to the proper quarters. The facts are these. Clothing of all sorts—new, nearly new, or frankly old—can be used to great advantage by the Ladies Guild of the Royal Medical Benevolent Fund. The Guild has a clothes room at the B.M.A. House in London, and at present sends out parcels twice a year to more than 350 families or individuals belonging to our profession but left in financial straits. In compiling these parcels great care is taken to make them really useful to the recipients, for often they are essential to self-respect and a minimum of comfort. Sometimes new garments are needed; for example, when the Guild sees to the requirements of a girl at boarding-school it makes sure that she shall have the same kind of outfit as her schoolfellows. Nevertheless money is only a small part of the need felt at the clothes room; and whatever is sent to it—from evening dresses to coal-scuttles—the sender may rest assured that it will be put to the best use by those in charge of the department. Of late years many have become increasingly aware of the claims of the unemployed, and the competition of such admirable organisations as the Personal Service League has in fact lessened the never-sufficient flow of clothing and gifts to the Guild. But often the discarded dresses and suits and undergarments of professional people are definitely more suitable for the dependants of doctors than for the unemployed in general; and if the situation of such recipients were better known many of us would probably be glad to pass on our clothes at a less advanced stage of degeneration. It is not only clothes that are wanted; curtains, bits of carpet, blankets, sheets, towels, toys—any of these things may make a big difference to old people who have known better times or young ones who have not. At this time of year, however, the first and foremost need is warmth,

and anyone who can produce a warm coat or an eiderdown or a boy's jersey could not do better than send it at once to the Ladies Guild of the R.M.B.F. at B.M.A. House, Tavistock-square, London, W.C.1.

CHRONIC GASTRITIS AND PERNICIOUS ANÆMIA

IN pernicious anæmia Castle's intrinsic factor is not produced by the patient's stomach, and there is a complete achlorhydria which usually persists indefinitely in spite of treatment. Fifty years ago Fenwick showed that the gastric mucosa, at least during a relapse, is atrophic, and the atrophy has since been regularly demonstrated by pathological and gastroscopic observations. Those are established facts, and they are commonly taken to mean that the gastric mucosa, congenitally defective or progressively damaged by gastritis, first loses its acid-secreting power and then its power of secreting intrinsic factor, at which stage pernicious anæmia appears secondary to the gastric defect, which is permanent and irreparable. This working hypothesis, however, has recently been somewhat shaken. Jones, Benedict, and Hampton,¹ from Harvard, describe 5 interesting cases of pernicious anæmia in which repeated gastroscopic examinations were made, and in 3 of the 5 were checked at operation by direct inspection and biopsy. They found atrophic changes in some cases, but hypertrophic changes in others, and what is more important, they have good evidence that these stomachs reverted strikingly towards normal when the pernicious anæmia remitted under treatment. If that is confirmed, it means that the structural changes in the gastric mucosa in pernicious anæmia are reversible, as the lingual changes in both pernicious anæmia and sprue are already known to be. If so, they can scarcely be a congenital defect, and are not easily explained as "inflammatory" in the classical pathological sense. The door is open for the suggestion that some sort of nutritive deficiency may determine them, and the suggestion is forthcoming, by analogy,

¹ Jones, C. M., Benedict, E. B., and Hampton, A. O.: *Amer. Jour. Med. Sci.*, November, 1935, p. 596.

from Miller and Rhoads,² who, by feeding swine on deficient diets, have caused acid and intrinsic factor to disappear from their gastric juice; they are not yet certain whether they have induced atrophic changes in the gastric mucosa at the same time. Whether it proves directly applicable to the pernicious anæmia problem or not, this work is of great value for directing attention to the influence of dietary factors on the structure and function of mucous membranes in general, a subject well worth further investigation.

A JOURNAL FOR THE PUBLIC DENTAL OFFICER

WE have received a copy of the first number of the *West Riding Dental Journal*, the first dental journal in this country to be issued expressly for the public dental officer. It is published by the dental staff of the West Riding County Council of Yorkshire with the laudable object of coördinating the medical and dental services in the riding. This issue opens with a series of excerpts from various reports which illustrate some of the salient features of school dentistry as well as the variation in methods adopted in different areas. A number of abstracts from current literature on the subject of school dentistry should prove helpful to the dental staff. Propaganda plays an essential part in securing the popularity of the school dental service and a committee of school dental officers in the West Riding has been considering this problem and their report is published here. We congratulate the West Riding authority on their enterprise.

THE MANIC-DEPRESSIVE AT LARGE

AT Tuesday's meeting of the Society for the Study of Inebriety an enlightening account of the inter-relationships between alcoholism, crime, and manic-depressive disorder was given by Dr. W. Norwood East, a commissioner of prisons. His paper appears in full on p. 161 of this issue. Dr. H. J. Norman, who followed him, expressed surprise that no one before Kraepelin should have given a really adequate description of the disorder. While the acute phase lasts there is no difficulty, even for the layman, in deciding that the person is insane, but at the beginning of a phase the question of diagnosis may not be at all easy; and when the phases are of brief duration, the symptoms may no longer be obvious when the individual comes under observation. Still greater is the difficulty when the morbid cycle is of the mild or cyclothymic type, in which eccentricities of conduct, even to a criminal extent, may occur, especially if self-control is still further impaired by alcoholic excess. The taking of alcohol to excess, often merely a symptom, is definitely so in some of these persons. As Clouston had pointed out, the morbid craving may be coincident with the period of depression, but far more commonly with the beginning of the periods of exaltation. Dr. Norman agrees with Dr. East that crimes of violence are committed much more frequently by the depressives; but it is the excited and exalted subjects who give the greatest amount of trouble by their mischievousness, malice, perversion of the truth, intractability, and destructiveness. For this reason those who have charge of manic-depressives often welcome, with a sigh of relief, the onset of the depressive phase. Dr. Norman admitted that the treatment of manic-depressive disorder is unsatisfactory. When its aetiology is discovered, it may be possible to devise efficient

therapeutic measures. Psychological treatment has not been successful. Dr. Norman said he was in full accord with Dr. East that imprisonment may be the only means of protecting the manic-depressive alcoholic from himself—if he does not become certifiably of unsound mind. But since anyone has the right to drink himself paralytic and poverty-stricken, the question of treatment becomes a forensic one. Some more effective means might, Dr. Norman thinks, be found to limit the right of the individual to do mischief to himself and to others—something, it may be, on the lines of the "family council" whereby a person is placed indeterminately under care and until such time as he can make his conduct approximate to that of the normal citizen. Clouston had insisted that the legislature must provide some remedy for this great evil to society and the intolerable hardship to relatives. "Something," Dr. Norman concluded, "might even have been made of Nero if, instead of being pandered to and given unlimited power, his liberty had been restricted and he had been compelled to obey for a longer period the wise counsels of Seneca and of Burrus. He might really have become a good violinist or a competent charioteer and thus fulfilled two of his ambitions instead of providing an example for incendiaries and multiple murderers."

PAIN FROM THE BILE-DUCTS

THAT biliary pain is sometimes due to dyskinesia of the muscle of the ampulla of Vater has been known for some time, and Dr. Charles Newman's Goulstonian lectures of 1933 made it clear that the two main types of disorder—the spastic and the atonic—are of everyday occurrence and everyday importance.¹ Hitherto the condition has been studied mainly by physicians and physiologists, and it is surprising that surgeons have not taken more interest in what is, after all, one of the common causes of symptoms persisting after cholecystectomy. The deficiency in surgical investigation has now been remedied, however, by Best and Hicken,² who have confirmed previous observations, and have demonstrated the spasm of the ampulla muscle after cholecystectomy by filling the bile-duct system with radio-opaque oil. The complete obstruction to the flow of bile and its purely spasmodic nature are well shown by the photographs they reproduce, and their work is a pretty demonstration of the rightness of conclusions drawn from the results of indirect investigation with the duodenal tube and from the beneficial effects of paralysing the muscle with atropine. There can now be no doubt that a purely functional spasm may lead to complete obstruction of the common bile-duct, and to considerable pain and digestive disturbance. One of the causes of this spasm is cholecystectomy, and it is the explanation of many instances of continued symptoms after operation. Best and Hicken also recognise, of course, that gall-stones and cholecystitis may reflexly cause such a spasm, but in their more surgical material have naturally taken less account of its origin in such conditions as duodenal ulcer, or of the commoner "primary" cases in which there is a more widespread state of vagal over-stimulation, attributable to "constitutional" causes. For the same reason they lay less emphasis than other writers on the value of sedative therapy with belladonna; but as a matter of fact it is remarkably successful in these

¹ Miller, D. K., and Rhoads, C. P.: *Jour. Clin. Invest.*, 1935, *iv.*, 153.

² Best, B. R., and Hicken, N. F.: *Surg., Gyn., and Obst.*, December, 1935, p. 721.

"surgical" cases. Insistence on the importance of functional, as well as organic, abnormalities has led to the relief of hitherto intractable symptoms arising from the extra-hepatic biliary system, and there must be other clinical problems in which it would be equally helpful.

A MENINGEAL FORM OF WEIL'S DISEASE

UNDER the name of "spirochétose méningée pure" French writers have been familiar since 1918 with a remarkable manifestation of human infection with *Leptospira icterohæmorrhagiæ* which seems to have escaped attention in this country and in Germany. It takes the form of a mild or moderate meningeal syndrome often accompanied by conjunctival suffusion, herpes labialis, and pyrexia.¹ The cerebro-spinal fluid shows only a slight increase in protein but a very large increase in cells, the majority of which are lymphocytes; counts up to 400 per c.mm. are on record. Jaundice may be present in this meningeal form of Weil's disease, but quite a number of cases are quoted in which there was no jaundice at all and in which conjunctival suffusion and a history of immersion in polluted water were the only pointers to the true nature of the disease. The cerebro-spinal fluid contains agglutinins for *L. icterohæmorrhagiæ* but their titre is much lower than in the blood. Guinea-pigs have been infected with blood and urine from pure meningeal cases. Where there is no jaundice or renal insufficiency the prognosis is highly favourable, and there appear to be no sequelæ. In view of the known existence of Weil's disease in this country among sewer-workers, canal-workers, coal-miners, and handlers of fish, the possibility of this meningeal form of the disease should be kept in mind, and it should not be necessary to wait for the appearance of jaundice before suspecting the possibility of leptospiral infection.

"CROCODILE TEARS"

IN 1905 H. K. Anderson² found that after excision of the ciliary ganglion the cut preganglionic fibres regenerated along the paths of the permanently destroyed postganglionic fibres and became functional. This was contrary to the accepted teaching of the time, which Anderson himself had helped to establish, that removal of autonomic ganglia was never followed by the least recovery. The probable explanation of the anomaly is now well known, and the laws of regeneration have been found to rest upon physiological rather than anatomical foundations. Transmission of nerve impulses across ganglia from preganglionic to postganglionic fibre is almost certainly achieved by the former liberating an acetylcholine-like substance which stimulates the latter and sets up new impulses. The preganglionic fibres are said to be "cholinergic." The postganglionic fibres, however, are of two kinds. Some of them stimulate the organs in which they end by liberating the same substance as do the preganglionic fibres, but others liberate an adrenaline-like substance. These last are said to be "adrenergic." The law of regeneration is that cut cholinergic fibres will, on regeneration, join up to old cholinergic end-points, but not to adrenergic end-points. Previous to Anderson's experiment, all ganglia which had been experimentally excised had had adrenergic postganglionic fibres, and these could not have been replaced by the cholinergic preganglionic

outgrowths. The ciliary ganglion, however, is now known to have cholinergic postganglionic efferents, and the manner of their replacement occasions no surprise (H. H. Dale³).

This theoretical background is implied in Mr. I. A. Tumarkin's interesting note (on p. 26 of our issue of Jan. 4th) on the syndrome of crocodile tears, when this occurs as a late sequel of Bell's palsy. He explains it on the ground of abnormal regeneration—"the nerve having undergone degeneration, new axons are pushing their way out seeking their various destinations. Unfortunately some are diverted, and find their way to the wrong muscle or gland." The same theory had been advanced⁴ by V. Uprus, J. B. Gaylor, and E. A. Carmichael to explain the recurrence of localised flushing and sweating after eating; they, as well as Mr. Tumarkin, drew attention to the fact that the best authenticated cases of crocodile tears followed a primary lesion in the region of the geniculate ganglion. The theory lacks actual proof, but the investigation carried out by the three authors named on a similar syndrome is extremely suggestive. The diagnostic importance of the theory is pointed out by Mr. Tumarkin, who gives details of the "fantastic course" pursued by the fibres causing lacrymal secretion. It is interesting to recall that this course was not always accepted, and that the general opinion was that the secretory nerves originated with the fibres of the fifth nerve. In 1902 Sir John Parsons published a review⁵ of the available anatomical, embryological, physiological, and pathological evidence on the point, and himself inclined to the view, now accepted, that they belonged to the seventh nerve. From the theoretical point of view, their important feature is that they are cholinergic. That other cholinergic fibres run in the seventh nerve is undoubted, for instance, vasodilator and secretory fibres to the submaxillary gland and various parts of the mouth, nose, and pharynx. If any of these, after section, grew down into the lacrymal gland, then an afferent stimulus giving rise (say) to salivary secretion would also cause lacrymation. There can be little doubt that this is what actually occurs.

ETHER CONVULSIONS

ONCE more that puzzling and dangerous complication, ether convulsions, has been the cause of a coroner's inquiry. On Dec. 31st at Camberwell, Dr. Douglas Cowburn inquired into the death of a woman, aged 53, who had been operated on for an abdominal growth. The convulsions began about an hour after the commencement of the operation, starting in the usual way with twitchings of the facial muscles. The ether used was proved to be pure, and in this and in other details the case does not differ from those previously described, though the age of the patient is rather above what is usual, and it is not reported that the patient had a septic focus or a high temperature—two features often observed. The convulsions are of course not always fatal, and many recoveries are on record. The last fatal case of which we have information occurred in London last summer, and it has been noted by Dr. Charles Hadfield that these fatalities are commoner in the warm months. This fits in with the latest theory of causation, put forward by Mr. Dickson Wright⁶—namely, that they are due to heat-stroke. He points out that in operating theatres to-day not only is the atmosphere kept warm but the patient, often

¹ Marie, J., and Gabriel, P., et al.: Bull. et mém. Soc. méd. Hôp. de Paris, Nov. 18th, 1935, p. 1454; Mollaret, P., et al.: Ibid., Dec. 9th.

² Jour. Physiol., 1905, xxxiii., 156, 414.

³ Proc. Roy. Soc. Med., 1935, xxviii., 15.

⁴ Brain, 1934, lvii., 443.

⁵ Roy. Lond. Ophth. Hosp. Rep., 1902, xv., pt. ii.

⁶ Brit. Med. Jour., 1935, i., 949.

already pyrexial, lies on a table heated by electricity or otherwise, and has probably had an injection of atropine which reduces heat-loss by abolishing secretion of sweat. Moreover, the ether vapour administered is often warmed. To those who share our disquiet about overheating and dehydration⁷ this theory is attractive; but it cannot be said to fit the facts of all recorded cases. Still less were these explained by the older suggestion that ether convulsions are due to impurities in the ether. This explanation indeed has been found untenable in almost every instance in which the ether has been carefully tested, although when it was first put forward by the late S. R. Wilson of Manchester there was much to support it. Some time ago the Anæsthetics Committee circulated a questionnaire to anæsthetists in many parts of the world in the hope of getting some light thrown on the causation of the convulsions; but the result was a complete disappointment. Continental anæsthetists seemed never to have witnessed convulsions under ether, and neither Canada nor the United States of America was able to provide an explanation more satisfactory than those put forward in Great Britain. Perhaps the oddest feature of the ether convulsion is its comparatively recent appearance. Ether was in use a number of years before 1912, when the first case was reported, and it is impossible to believe that the symptom could have escaped notice and description by anæsthetists of the vast experience and powers of observation possessed by Frederic Hewitt, Dudley Buxton, Walter Tyrrell, and others of that day. From the assumption that it was a new symptom came the suggestion that it arises from new methods of administration; yet this will not hold, for in some of the recorded cases the ether was given by the simple open-drop method. At present we must face the fact that ether convulsions, though still a rarity, are commoner than they were, and that their cause is unknown.

RELIEF OF ANGINAL PAIN

EFFORT angina, and the rarer spasmodic angina which comes on at rest but is not dependent on coronary occlusion or myocardial infarction, are nearly always readily relieved by the quickly acting vasodilator drugs. In fact, effort angina may immediately disappear if at the first warning the patient rests; while a tablet of nitroglycerin may enable effort to be made in comfort which would otherwise be impossible. On the other hand, carefully controlled observation on many drugs has shown that their continuous administration is of no benefit, and it is therefore surprising to read a report which claims for one of these not only the dramatic relief of paroxysmal cardiac pain but also its prevention when taken continuously. The drug is Aminophylline or Euphyllin, and Dr. J. F. Quigley⁸ describes its successful use for angina and also other forms of cardiac disturbances—though he makes no clear distinction between angina of effort, spasmodic angina, and myocardial infarction. The total amount of the drug used, in the form of tablets and injections, is stated, but not the total number of patients treated; notes on six cases (only four of which appear to have had some form of angina) are given, and it is admitted that the action in two of these was unfavourable. It is difficult to accept the view that a cardiac pain which does not respond to amyl nitrite will be relieved by a much less powerful vasodilator; yet this claim

arises from one of the successful cases, in which an agonising attack which had lasted an hour was completely relieved before the intravenous injection of 10 c.cm. of aminophyllin had been completed. Dr. Quigley gives some clinical criteria for the differentiation of "angina pectoris," by which is presumably meant effort angina, and "coronary disease," which may be taken to mean coronary occlusion or myocardial infarction. The description of the former as frequently unbearable is somewhat out of date; it would be better to say that it is usually mild; and to say no more of the treatment of myocardial infarction by morphia than that it may be of little help is rather an understatement of its value. The evidence so far available suggests that in the treatment of angina of effort (including spasmodic angina) there is nothing which nearly approaches the nitrites; and for most cases of myocardial infarction morphia is of the greatest use. Dr. Quigley's present report does not justify any modification of this generally accepted opinion.

SERUM TREATMENT OF STREPTOCOCCAL INFECTIONS

THE hæmolytic streptococci pathogenic for man comprise a number of diverse antigenic types. Their full number is as yet unknown, but they appear to be numerous, for F. Griffith¹ has already succeeded in identifying 27. These streptococci produce disease in virtue of two attributes, the ability to elaborate toxin and the power to invade the tissues. Some strains owe their pathogenicity almost exclusively to their ability to produce toxin—the scarlet fever strains, for example. Others depend largely, if not entirely, on invasiveness. Between these two extremes come strains whose pathogenicity is a product of both these factors. The truth of this is reflected in the results obtained in the treatment of streptococcal disease with antitoxic sera. If one excludes scarlet fever—in which condition streptococcal antitoxin has proved its efficacy—it has to be admitted that the use of this type of serum has given disappointing results. In some cases the results have been excellent, but in many others the serum has been without effect. To combat infections due to the invasive type of strain one must use an antibacterial serum, and unfortunately efficient sera of this type are not available. The polyvalent streptococcal antisera prepared in the past have not been a success; but when one remembers the great variety of antigenic types presented by the hæmolytic streptococci, and that a serum of the antibacterial type to be effective must possess type-specific antibody, this lack of success is not surprising. Whether the future will produce a satisfactory serum of this type it is too early to predict; at the moment the logical outcome of recent research would seem to indicate a polyvalent serum prepared against a very large collection of strains. In the meantime, however, we are not entirely powerless against this type of streptococcal infection. A note by Dr. Hendry and Dr. Griffiths, appearing elsewhere in this issue, describes a case which was successfully treated by immuno-transfusion. The patient, a woman infected with a highly invasive strain of streptococcus, received four injections of streptococcal antitoxin without material benefit. Her husband was then immunised with the strain which had been isolated and the patient was treated with whole blood from the immunised donor. Seven injections of 15 c.cm. were given, and on each

⁷ THE LANCET, 1933, i., 95.
⁸ Prescriber, 1935, xxix., 197.

¹ Griffith, F.: Jour. of Hyg., 1935, xxxiv., 542.

occasion they were followed by great improvement, the patient making a good recovery. Admittedly this is only one case, and Hendry and Griffiths consider that possibly the whole blood was effective in virtue of its complement content. In support of this contention is the report of good results which sometimes follow transfusion with blood from normal healthy donors. A recent paper by Stahl² gives his experience of this form of treatment. But work by Ward and Lyons³ in the United States has shown that the serum of healthy adults often contains antibody which is protective against one or more strains of hæmolytic streptococcus, so that simple transfusions may sometimes be providing the appropriate antibody as well as complement. This work suggested the possibility of using donors possessing the requisite antibody in the treatment of invasive streptococcal infections, and the procedure evolved, together with illustrative cases, is given in a paper by Lyons which has just been published.⁴ Briefly, his method consists in matching the donor against the streptococcus obtained from the patient. This is done by testing sera from a number of prospective donors by an in-vitro phagocytic test and selecting for donor the one whose serum produces the greatest degree of phagocytosis of the patient's streptococcus. And should the patient's clinical condition suggest that toxin is playing some part in the production of symptoms, then antitoxin is given as well. Lyons's work is still in its early stages and it will be interesting to see what sort of results he obtains with a more extended trial. But the method seems sound scientifically and well worthy of trial.

POLIOMYELITIS VACCINATION: A WARNING

Two forms of poliomyelitis vaccine are on trial in the United States.⁵ One of them, Kolmer's, is a living virus attenuated by treatment with sodium ricinoleate; the other, Brodie's, is a virus killed with formalin. At the annual meeting of the American Public Health Association last October⁶ it was agreed that Brodie's formalised vaccine is safe, though not necessarily efficacious. It had been given to 8000 persons, and though 1 of these had soon afterwards developed poliomyelitis there was reason to suppose the vaccine innocuous. On the other hand, of 12,000 persons receiving Kolmer's living attenuated virus as many as 9 had subsequently developed the disease; and, though Kolmer was convinced that all of them were already incubating the infection at the time of inoculation, his critics were by no means satisfied. Their doubts will be increased by a grave statement published in the *Journal of the American Medical Association* for Dec. 28th by Dr. J. P. Leake, medical director of the United States public health service. He summarises 12 cases, reported to the service, in which paralytic poliomyelitis has followed, at suggestive intervals, the injection of unnamed vaccines, A and B. Of the 9 having Vaccine A, 5 died; of the 3 having Vaccine B, 1 died: the ages of all but one were under ten years, and the deaths occurred 6-14 days after a first or second dose. Paralytic poliomyelitis was not endemic in any of the localities in question, and after estimating the probability of its accidental manifestation in vaccinated persons Leake concludes that the likelihood of the whole series of cases being due to natural causes is extremely small. This likelihood is further

reduced by the fact that in every case in which the sequence is known the level of the spinal cord first affected corresponds to the extremity into which the injection was made; that is to say, if the child was inoculated in an arm the paralysis developed in an arm, though not necessarily in the same arm. This is strong support, Leake adds, to other evidence that the virus of poliomyelitis is transmitted along nerve-fibres and not through blood or lymph; and he thinks the remarkably high fatality-rate may be attributable to close proximity between the part of the cord primarily infected and the nuclei corresponding to the muscles of respiration. His final conclusion is that "although any one of these cases may have been entirely unconnected with the vaccine, the implication of the series as a whole is clear," and many physicians may feel that it "renders undesirable the further use of poliomyelitis virus for human vaccination at present."

THE centenary of the University of London will be celebrated this year, probably from about June 29th to July 3rd, when many visitors from overseas will be attending the congress of the universities of the empire and the Anglo-American Historical Conference.

PUBLIC response to Canon Sheppard's broadcast appeal has ensured the despatch of a second British Red Cross Unit to Abyssinia for service on the north-western front. The general stores and the medical and surgical equipment and comforts will be completed by Jan. 18th, and it is anticipated that the unit will leave this country in the following week.

THE prizes for original research into rheumatism offered by the Soviet Government to the council of the Ligue Internationale Contre le Rhumatisme have been awarded to Dr. G. Kahlmeter (Stockholm), Dr. M. P. Weil (Paris), Dr. Ernst Freund (Vienna), and Dr. Bernard Schlesinger (London). As the prizes were offered by the Russian Government the communications submitted by Russian workers were not considered for the prizes; but those of Prof. Talalaef and Prof. Danischewsky were highly commended.

WE publish in another column an appeal for a recognition of the practical services of Dr. Rowland Fothergill on behalf of the medical profession in general. Dr. Fothergill's activities have been manifested within the official working of the British Medical Association, but his voluntary labours, through the Association, have helped to the formation of an effective medical organisation under the National Insurance Acts. Dr. Fothergill is giving up practice, and this is therefore a particularly appropriate time at which to make practical acknowledgment of the debt due to him from all. A Fothergill Testimonial Fund has been opened and subscriptions should be directed to the treasurer of the Fund, B.M.A. House, Tavistock-square, London, W.C.1.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.—A meeting of the fever hospital medical service group will be held at the house of the society, 1, Thornhaugh-street, Russell-square, London, W.C., on Friday, Jan. 31st, at 4 p.m., when papers on the serum treatment of typhoid fever will be read by Mr. A. Felix, D.Sc., and Dr. C. J. McSweeney. Dr. James Fenton left on Jan. 10th to attend the first South African Health Congress to be held at Cape Town, from Feb. 3rd to 8th. He represents the Royal Sanitary Institute (of which he is chairman), the Royal College of Physicians of London, and the Society of Medical Officers of Health.

² Stahl, R.: *Med. Klin.*, Oct. 4th, 1935, p. 1302.

³ Ward, H. K., and Lyons, C.: *Jour. Exp. Med.*, 1935, lxi, 515 and 531.

⁴ Lyons, C.: *Jr. Amer. Med. Assoc.*, Dec. 14th, 1935, p. 1972.

⁵ See THE LANCET, 1935, i, 686; 1935, ii, 1131.

⁶ *Ibid.*, 1935, ii, 1081.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXXXV.—THE PROGNOSIS IN DEAFNESS

I

THE causes of deafness may be broadly divided into (1) disease and degeneration of the perceptive apparatus, the cochlea, auditory nerve, and brain centres, the so-called nerve-deafness; and (2) affections of the conducting mechanism, that is, of the external auditory meatus and of the tympanum with its adnexa. It is with the latter group which is by far the more common that we shall deal first.

Conduction deafness is characterised, in distinction to nerve-deafness, by a greater loss of perception of low than of high tones of the scale, and by a greater loss of perception of sounds transmitted through the meatus, air-conduction, than of those transmitted by the bones of the skull, bone-conduction. Clinically, perception by bone-conduction may even seem to be better than normal, i.e., increased, though it appears from experiment in a perfectly sound-proof chamber that this is never actually the case. When the normal relation between air- and bone-conduction is so much altered that a tuning-fork is heard longer on the skull than at the meatus, Rinné's test is said to be negative; in cases of unilateral deafness of this kind, a tuning-fork on the middle line of the cranium is usually heard more loudly in the deaf ear and Weber's test is said to be to the affected side. But when the affection of the middle ear has only caused a slight diminution of hearing, not sufficient to invert the usual relation, Rinné's test will still be positive. Again, in middle-ear disease of long standing, as well as normally in old people, there is a tendency to degeneration of the internal ear and bone-conduction becomes shortened.

Obstruction of the External Auditory Meatus

This is an obvious cause of deafness. Hearing remains unimpaired as long as a small chink remains by which air and sound-vibrations can reach the drum; it is for this reason that the slow accumulation of wax often causes deafness of sudden onset. Deafness from obstruction by cerumen or eczematous debris is, of course, quickly relieved but, as these conditions are often accompanied by some degree of myringitis, the hearing does not always return to normal at once. The removal of foreign bodies may be easy or exceedingly difficult; in order to avoid the danger of injuring the drum, a general anæsthetic is often advisable, especially for children, except in the simplest cases, and a post-aural incision may be necessary. The prognosis should not be too optimistic until it is seen that the drum is unhurt; atresia may ensue if the meatus has been severely damaged. The meatus may be blocked by an exostosis, which here takes the form of a round pedunculated tumour; hearing is fully restored by its removal which is usually best performed through a post-aural incision. In cases of hyperostosis of the meatus, a condition in which three sessile bony outgrowths contract the meatus to a Y-shaped slit, the prognosis must be very guarded; removal is difficult and liable to be followed by stenosis, and the condition is apt to be accompanied by signs of nerve-deafness; it is usually wise to be content with keeping the meatal passage clear of debris, and fortunately the growth is very slow and rarely causes complete obstruction. The dilatation of stenosis due to injury is tedious and relapse is common, but it is possible

to restore a lumen sufficient for normal hearing; when, however, the meatus is completely occluded by scarring, the prognosis becomes uncertain, because it is impossible to know beforehand to what extent the tympanum has been damaged by the original traumatism. Congenital absence or atresia of the meatus is so often associated with malformation of the middle and/or internal ear that it is only worth while to attempt to make a meatus by plastic methods in the rare cases where the deformity is bilateral and bone-conducted sounds are well heard.

Deafness Due to Inflammatory Causes

With the exception of otosclerosis, a peculiar form of deafness to be considered later, the disease of the middle ear which causes deafness is almost always of the nature of an inflammation which passes along the Eustachian tube from the nasopharynx, and which shows an infinite variety of acuteness and virulence. The principal site of incidence of the inflammation, and of any resulting fibrosis, also varies, so that either the Eustachian tube, the drum-membrane, or the inner tympanic wall may bear the brunt of the damage; a lesion of the first is generally the most curable, while fibrosis in the region of the fenestræ causes the most severe and intractable forms of middle-ear deafness. It was formerly considered certain that the important path by which sound-vibrations are conducted to the cochlea is by way of the membrana tympani and chain of ossicles, but of recent years considerable doubt has been thrown upon this, and the theory has gained ground that the chief function of the ossicular chain is to damp and regulate the sounds.

ACUTE SUPPURATIVE OTITIS

The more virulent forms of inflammation usually produce a simple acute suppurative otitis; if infection be still more virulent, or be favoured by anatomical or constitutional factors, mastoiditis supervenes; in the most severe types, especially in those associated with the specific fevers such as scarlet fever, measles, or influenza in certain epidemics, the severe complications occur: sinus-thrombosis, cerebral abscess, meningitis, and labyrinthitis, the two latter causing severe deafness from damage of the internal ear, and all causing danger to life with which we are not here concerned. In the great majority of cases acute suppuration heals within three or four weeks under proper attention, and fortunately often even without it, leaving a healed membrane with a barely visible scar and no noticeable deafness, though some slight impairment compared with the other ear can more often be detected by careful tests. By proper attention is meant timely incision of the membrane when spontaneous perforation is delayed, and strict cleanliness of the meatus to avoid secondary infection. If the discharge fails to diminish in from two to three weeks, any nasopharyngeal infection must be treated, and especially should adenoids be removed in children and young people, for the ear will often become dry in a few days after this operation. If this treatment fails or is not indicated, and suppuration persists undiminished for three or four weeks, the simple mastoid operation should undoubtedly be performed even in the absence of all other symptoms; apart from the danger to life from the persistence of the suppuration (and quite extensive disease is

usually found in these cases) operation at this stage may be relied on in nearly all instances to leave an ear with an intact drum and little or no impairment of hearing. The longer that suppuration persists after four weeks, the more likely is deafness to result, and the greater probability is there of a permanent perforation of the drum which conduces to recurrence of the attacks.

ACUTE CATARRHAL OTITIS

Acute catarrhal otitis is the result of a less active inflammation and may show all grades of severity from a tympanum full of serous or mucoid fluid to a slight impairment of the patency of the Eustachian tube. As pain and constitutional disturbance are less marked, deafness is here a more obvious symptom; the patient often complains that his own voice echoes or sounds unduly loud, and musical tones are frequently heard out of tune which is a serious matter for musicians. Clinically, there may be much obstruction of the tube with or without secretion in the tympanum, or the latter may be full of fluid without any great Eustachian obstruction. Inflation gives marked relief; in young children politizerisation must suffice, but in adults inflation with the catheter is preferable. This must usually be repeated at intervals of one, two, or three days for some six to twelve times before cure is obtained. A single attack of acute catarrhal otitis nearly always ends in complete recovery of hearing, and often without treatment, but in some the hearing is left impaired; hence the importance of treating and keeping under observation all such cases until restoration is complete. Unfortunately attacks are liable to recur and sometimes to follow every cold, especially in children and young adults. This is a very frequent cause of chronic deafness, and every effort should be made to find and treat any predisposing cause in the nose or nasopharynx; adenoids are of all affections the most likely to be the source of trouble, but unhealthy tonsils, sinusitis, and nasal obstruction must not be overlooked. This does not mean that every septal deviation or spur should be removed, for here considerable judgment is required, but it is all-important that a healthy condition of the nose and throat be obtained. Occasionally an acute catarrhal otitis fails to clear up and a subacute condition remains in which a collection of fluid tends to persist in the tympanum. In such cases it is useful to suck out the fluid at regular intervals by means of a Weber-Liel tube passed along the Eustachian catheter, but if this fails to prevent its accumulation, the drum should be incised with careful antiseptic precautions and the secretion, usually a thick mucus, blown out with the catheter. This may seem a drastic form of treatment for a non-suppurative condition but, if it be allowed to persist, the hearing will be permanently damaged. Although the majority of cases of acute middle-ear inflammation recover without permanent deafness, the minority who suffer lasting damage are sufficiently numerous to form a large and important class of the community; frequently this is the result of severe destruction caused by scarlet fever. Closer attention to the acute forms of aural disease has already done much, but can do much more, to diminish their number; the public needs education on the importance of seeking skilled attention in these conditions, and especially on the harm which results from neglecting earaches in childhood.

CHRONIC MIDDLE-EAR DEAFNESS

Chronic middle-ear deafness may be the result of damage caused by former suppuration. Its degree

varies greatly with the site of the principal lesion; a perforation of the drum may be attended by surprisingly little disability, while fibrosis and adhesions within the tympanum, especially about the fenestræ, cause severe deafness. This fibrosis is very similar to the state of affairs found in non-suppurative chronic middle-ear catarrh, but with this difference, that it is usually not progressive. In some large perforations an "artificial drum" composed of a disc of cotton-wool moistened with liquid paraffin gives marked improvement of hearing. After the radical mastoid operation has been performed, the hearing is always below normal, but the effect of the operation is very variable and is difficult to estimate beforehand; if deafness is severe before operation, and especially when the ear is blocked by cholesteatoma or granulations, the hearing will probably be somewhat improved but, if the hearing has previously been fairly good, it is likely to be made worse. It is important, while operating, carefully to respect the inner tympanic wall in order to avoid scarring in this region.

CHRONIC CATARRHAL OTITIS

The commonest cause of chronic deafness is chronic catarrhal otitis, which is sometimes labelled chronic hypertrophic or chronic hyperplastic catarrh according to whether the principal lesion is thought to be a thickening of the mucosa or the formation of fibrous tissue; in any case they seem to represent different stages of the same process. The affection is probably always caused by former, usually repeated, attacks of acute or subacute catarrh, but, as the onset is very gradual and the normal perception is greater than is required in civilised life, patients seldom come for treatment until the deafness is advanced, while the attacks of otitis which have initiated the process frequently have occurred in childhood or youth and have been forgotten. The deafness usually tends slowly to increase, but there may be long intervals, even of many years, without progression, making it difficult to evaluate the effect of treatment. Attempts have been made in the past to remove scar-tissue and to loosen adherent ossicles by operation, but, apart from the danger of causing suppuration, results have not been permanent and such operations have been abandoned. Indeed, there is as yet no method of influencing fibrosis within the tympanum; obstruction in the Eustachian tube can, however, be favourably affected and, in some cases, cured by such treatment as the use of Eustachian catheters, bougies, and topical applications, and not infrequently inflation has a beneficial effect on the hearing even in the absence of noticeable obstruction. If a short tentative course of such treatment is found to produce progressive improvement, it should be persevered in as long as improvement continues; in this way a considerable proportion of cases can be brought to a higher level of hearing, and maintained there by occasional repetition of treatment. A short trial of such methods is always worth while, and sometimes gives improvement in unexpected cases. Mechanical oto-massage sometimes gives subjective relief, but is seldom found to produce a real or lasting improvement. Massage by means of sound waves, as produced by the electrophonoïde of Zünd-Burguet, is warmly advocated by some; it demands a long course of treatment and speedy relapse seems to be frequent.

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(To be concluded)

SPECIAL ARTICLES

ALCOHOLISM AND CRIME IN RELATION TO MANIC-DEPRESSIVE DISORDER*

By W. NORWOOD EAST, M.D., F.R.C.P. Lond.

H.M. COMMISSIONER OF PRISONS

THE terms mania and melancholia were used formerly to differentiate mental states which were looked upon as separate disease entities. Later, it was recognised that periods of mania and melancholia, of mental elation and mental depression, might occur as two stages in the same disease, and Kraepelin in 1896 introduced the concept of a manic-depressive disorder. It is unnecessary here to consider the various types of mental alienation which Kraepelin included in this term. He emphasised the important fact that although attacks might occur throughout the life of the individual they were not followed by pronounced mental enfeeblement. Indeed, the subjects of the disorder are frequently of good intelligence. Kraepelin associated the condition with symptoms of physical deterioration, but Kretschmer, Rehm, and others have found themselves unable to accept this view. Kretschmer seeks to connect certain physical states with psychological types and considers manic-depressive disorder to be associated with the *pyknic physique*.

A hereditary predisposition to mental disorder is an important aetiological factor in many manic-depressive subjects, and cases can be conveniently divided into two main groups. In one, the attacks appear to arise without any apparent cause; in the other, to be determined by a constitutional inability of the patient to adjust himself to accidental happenings which would present no such difficulty to a normal person.

The disorder consists of three phases: a state of mental depression, of mental exaltation, and a subsequent period of normal mental health. These phases may occur in variable order and may last for varying periods, and occur at irregular intervals. In both the depressed and exalted phases three fundamental symptoms are to be noted. In the depressed phase emotional depression, psychomotor retardation, and difficulty in thinking; in the exalted phase, emotional elation, psychomotor activity, and a rapid flight of ideas. In the depressed phase the patient experiences mental pain, the bodily movements and thought processes are slow, but consciousness is retained; the subject is aware of his surroundings and is often able to appreciate that he is mentally ill. In the exalted phase the patient has an exaggerated sense of well-being; he is over-active, restless, excitable, inconsistent, and changeable, and may be unable to exercise self-control. His memory may be clear, but his judgment is impaired and he does not realise that he is ill.

This brief outline of symptoms will require amendment if the disorder is present in an aggravated form. The most profound degrees of melancholia with stupor, delusions, and hallucinations may then be present; and in the alternating phase intense excitement, violence, and incoherence with delusions and hallucinations. On the other hand, the symptoms may be so slight in the milder cases as to escape notice either by the patient or his friends and associates,

and may pass by imperceptible gradations into normality. It is of particular medico-legal importance to remember that the temperamental level of many normal persons is not constant but rises and falls to lesser or greater heights from time to time, and it is a common experience to find among our personal friends and acquaintances some who for no assignable cause have their good and bad days according to the measure of their emotional variations.

Association with Crime

It will be apparent from these facts that the relationship of alcoholism and crime to manic-depressive disorder may be clear and unequivocal when the abnormal mental state is well-defined, but may be determined only by a skilled observer when normality is approached. How difficult it may be to form a correct opinion in the latter type of case was forcibly impressed on my mind many years ago when carrying out observations on prisoners who had been remanded from the police-courts on charges of attempted suicide, and in whom mental depression was attributable to external factors and alcohol had had been consumed in order to combat the affective state. A true assessment of the mental condition in such cases is important as a guide to the future, because manic-depressive disorder, it will be remembered, is recurrent. It should be remembered also in this connexion that an attempt at suicide in England is a misdemeanour for which a considerable sentence of imprisonment may be imposed. Further, in pre-war years, particularly it was frequently associated with alcoholism.

Crime, however, is associated with both major and minor manic-depressive states apart from alcoholism. Here again prolonged observation may be necessary before the mental condition underlying anti-social conduct can be disclosed. It must be noted also that criminal conduct in a manic-depressive subject may be unconnected with the abnormal phases of his life.

For example, a youth 20 years of age was sentenced to detention in a Borstal institution for stealing a motor-car. He was of foreign parentage and nothing of medical importance in the family history was admitted. He stated that his mother died when he was fifteen years old, and that he was much depressed at the time in consequence, and had suffered from at least five attacks of depression since then. He went to the United States of America and obtained work on a farm but stole a horse and was convicted and sent to an industrial school. He worked as a labourer on attaining his discharge, but in a few months was reconvicted for robbery and returned to the school. He was convicted later for stealing a motor-car and was deported to England. On arrival he stole a car with a man he became acquainted with on the voyage; they were arrested, and he received the current sentence. Immediately after arrest he came under the observation of experienced prison medical officers, and his mental condition was considered to be normal. A few months later he became rather unusually good-tempered and friendly; he was boisterous and appeared to have a surplus of energy. In a few weeks he became less aggressively purposeful. As time passed, although he continued to work well in the institution, he became quiet, disregarded his companions, and was uninterested in his surroundings. Two months later he became again unsettled, restless, talkative, aggressive, and mischievous. His memory at this time was unusually retentive, and a press of activity was noticed at work and throughout the various duties of the day. This phase passed off in a few weeks and he regained his normal mental level.

So far there has been no evidence to connect the criminal conduct directly with the mental disorder.

* A paper opening a discussion at the Society for the Study of Intebriety on Jan. 14th, 1936.

But it should be observed that some manic-depressive subjects are eccentric and unstable when they have attained their normal mental health and are then potential delinquents as a result of their mental constitution.

Manic-depressive disorder gives rise to criminal conduct apart from alcoholism. In one case a strictly abstemious man who had suffered from three previous attacks killed his wife in the depressed phase of a subsequent attack. The murder was unconnected with alcohol. The most important point to note here is the fact that crimes of violence are more frequent in depressed than in exalted states. I have pointed out elsewhere¹ that in a series of 53 depressed law-breakers 34 committed crimes of violence, and in a series of 52 exalted subjects only 7 were so convicted. Recent figures of insane homicides at Broadmoor criminal lunatic asylum show that 62 murders were associated with melancholia and 28 with mania.

It is generally accepted by those who are concerned with the administration of justice, and with the administration of penal institutions, that the proportion of first offenders who commit crime again is relatively small. It is also generally accepted that many others soon acquire a habit to commit crime which may be unconquerable. A manic-depressive subject may pass through phases of the disorder without committing any offence although some attacks are associated with crime, but personal experience leads me to believe that when the disorder is associated with alcohol the tendency to commit crime is materially increased. Further, the fact that crime was repeatedly associated in the same subject with manic-depressive disorder would lead me to consider whether alcohol was a contributory influence.

When repeated crimes are due to the disorder, and alcohol is not an added factor, the intervals of normal mental health may be free from the moral degradation which is to be observed not infrequently when the condition is associated with alcohol. A man was convicted of assaulting the police and was aggressive, offensive, contumacious, boastful, excited, and abusive when received into prison. He made false accusations against the staff and was unashamed when they were proved to be untrue. He appeared to be an unscrupulous and revengeful man, but his conduct and ethical standards were not inferior to those of his class in life when he regained his mental health.

In marked contrast is the case of a man who has been coming to prison for many years. He has been under treatment also in mental hospitals and has been diagnosed as a case of manic-depressive disorder by different alienists. His offences, which include theft, false pretences, assault, and drunkenness, have been attributable at different times to alcohol, to manic-depressive disorder, to both combined, and sometimes to a now well-established habit to commit crime. His reputation is such that those who know him are quite unable to place the slightest confidence in him at any time.

Association with Crime and Alcohol

When manic-depressive disorder is associated with alcohol and crime results the evidence of recent excessive drinking may be so overwhelming and that of the underlying mental disorder so insignificant as to escape demonstration. In such cases the past history of the individual may assist the diagnosis, and if there is reason to believe that previous conduct was due to manic-depressive disorder it may be desirable for those conducting the defence to call

medical evidence to support this view at the trial. In this event a medical witness will not belittle his position or the value of his evidence provided he submits his opinion as a possibility and without unqualified assurance. I do not mean to convey the impression that medical evidence should not be given with all the force that circumstances permit, but I have no doubt that some witnesses have not been as acceptable as they might have anticipated because they assumed more than they could substantiate and confused assumptions with facts.

A man was charged with the murder of his sweetheart in circumstances which left no doubt that he had committed the crime. The dead girl was found with a fatal wound in her throat and the accused lay a few yards away with a self-inflicted wound across the upper part of his neck. On reaching the hospital the house surgeon noted the man's breath smelt of alcohol, and he volunteered the statement that he killed the girl because she had been teasing him. This may have been true but was an inadequate motive, as indeed must be any motive for murder. The accused admitted that he had been drinking heavily for some little time before the crime, and there was corroboration of this as two days before he had been turned out of the girl's home as he arrived there in a drunken state. He was received into prison eleven days after the murder and was rational in conduct and conversation and showed no evidence of insanity then or whilst awaiting trial; but he made varying and contradictory statements at the medical interviews in order to suggest that he was of unsound mind. It is unnecessary to enter into these recitals here in detail, suffice it to say that it became quite clear that they could not be accepted. This conclusion was confirmed long after the trial; the prisoner then admitted to me that he had spoken falsely when he said he had no recollection of the circumstances connected with the crime. There was no evidence to support the view that the crime was the result of epilepsy, although this was put forward as a defence at the trial, apparently because the alleged amnesia was accepted. There was, however, reason to believe that the prisoner had suffered previously from periods of mental depression for which there appeared to be no external cause and which led him on one occasion to make an attempt at suicide. He combated these attacks by drinking to excess in order to gain confidence so that "he could feel himself as himself." Certain of his uncorroborated statements, if true, supported a diagnosis of alcoholic hallucinations, and the view that he was insane at the time of the crime. I was unable to go further than this in my evidence at the trial. The prisoner was found guilty of murder and sentenced to death, and was later reprieved.

The case presented difficulties inasmuch as the accused was clearly malingering insanity; it was also evident that the crime was related to alcohol, but it was less certain that it was associated also with manic-depressive disorder. I was able to observe the man during subsequent years in prison during which he passed through phases of mental depression which left no doubt that the crime was the result of alcoholic excess in a manic-depressive subject.

Association with Alcohol

Drunkenness may be associated with other forms of mental disease, with, for example, delusional insanity, dementia præcox, general paralysis of the insane, senile dementia, epilepsy, and high-grade mental deficiency. This society is chiefly interested in the association of manic-depressive disorder and alcoholism not involving criminal conduct. It is, however, quite impossible to draw any hard-and-fast line here as drunkenness, if followed by certain conduct, may itself constitute a crime and lead to the police-court.

More than 40 years ago Legrain² divided alcoholists into three classes: drinkers with an abnormal instinct,

defective moral sense, and want of moral equilibrium; drinkers with an abnormal tendency, including drinkers through taste, weak-mindedness, and want of mental equilibrium; and drinkers through impulse. In the last class were included dipsomaniacs and these were divided into pure dipsomaniacs and pseudo-dipsomaniacs. Pure dipsomania was defined as a "morbid condition, characterised by the irresistible obsession and impulse to drink coming on in attacks during which the patients are in a condition of impotence of will and manifest great anguish." Legrain observed that an attack of dipsomania might remain an isolated event in the life of the subject, but usually the attacks were repeated and assumed a periodical character. The concept of manic-depressive disorder had not been formulated at this time, but Legrain referred to the fact that Krafft-Ebing and others classified it among the periodical insanities, whilst other observers, struck by the depressed aspect of the patients especially at the commencement of an attack, saw in dipsomania a variety of melancholia. Pseudo-dipsomaniacs according to Legrain were drunkards who possessed a genuine desire to combat their craving, but were unable to do so through weakness of will.

We are concerned in this discussion with the periodic drinking associated with manic-depressive disorder, the true dipsomania of Legrain in which drinking is only an outward manifestation of underlying psychological, and perhaps physiological, causes independent of habit formation. The advisory committee to the Central Control Board in their work on Alcohol³ stated that:

"In these relatively infrequent cases, to which the name dipsomania is sometimes given, the patient drinks heavily for a period ranging in different cases, but usually of approximately constant length for the same case, and then, when the attack ceases or passes into another phase, he returns to sobriety—a fact, it may be noted incidentally, which goes to show that alcohol has no very strong habit-forming influence."

Too limited a view may be taken of dipsomania if the term is restricted to manic-depressive subjects, for some authorities consider that it may be related to epilepsy, and may also be the expression of a compulsion neurosis. The consumption of alcohol in manic-depressive disorder is connected directly with the current emotional state; in the depressed phase the patient has learnt by past experience its comforting effects; in the elated phase he is so joyous and expansive that he must share his happiness with others in extravagant festivity. In the former state the alcohol is consumed in order to avoid reality, in the latter to enhance it.

Segregation in Prisons and Retreats

The number of persons annually convicted of drunkenness is still considerable and the last figures published⁴ show how the year 1933 compares in this respect with recent years.

Year.	Convictions.	Year.	Convictions.
Average of } 1925-1929 }	66,858	1931	45,842
1930	57,131	1932	33,100
		1933	39,751

There was a continuous and rapid decrease until 1932, in 1933 there was a 20 per cent. increase over 1932, but the 1933 figure was still much below the figure for 1931 and earlier years. The number of persons received into prison for drunkenness, &c., during the last five years are as follows⁵: 1929, 7876; 1930, 8611; 1931, 7484; 1932, 5836; and 1933, 6631. No figures are available to show the number of those persons who are manic-depressive

subjects. The proportion is probably small, but the total may be not inconsiderable.

Persons are sent to prison as a punishment and not to be punished, and although it may seem illogical to-day to imprison anyone because his conduct is the result of a constitutional disorder over which he has no control, it is to be remembered that prisons serve also to protect the public, actually during the time the lawbreaker is detained, and potentially as the result of its deterrent effect. If binding over, fines, and probation have no effect on an offender whose conduct is a nuisance to society, imprisonment may be necessary ultimately even though he is not a serious menace to law and order.

Moreover, imprisonment may be the only means of protecting the manic-depressive alcoholic from himself. For it will be agreed that a large number are not certifiable, or are not certified, under the Lunacy Acts, others refuse to accept the provisions of the Mental Treatment Act, 1930, and enter a mental hospital as a voluntary patient, and others refuse to enter a retreat. On reception into prison they come under medical care and supervision and their return to normal mental health is expedited, partly as a result of medical treatment, partly because the orderly life is conducive to recovery, and also because alcohol and other causes of mental imbalance are no longer operative. It may be hoped that imprisonment will act sometimes as a deterrent also, if its imposition suggests to the subject that society not only disapproves of his conduct but considers he can amend it. However this may be, the patient and the public must be protected from the effects of his disordered mind, and although it may seem harsh, yet, in our present state of knowledge, temporary detention in a penal institution may be the only satisfactory method of dealing with some of these cases.

It will be known to the members of this society that the number of alcoholists detained in licensed retreats under the Habitual Drunkards Act, 1879, is almost negligible at the present time. The average for the period 1925-1929 was twelve; the number for the year 1930 was nine; for 1931, eight; for 1932, one; for 1933, seven; and for 1934, one.⁶ My experience as inspector under the Inebriate Acts leads me to consider that some manic-depressive alcoholists are suitable cases to deal with under the Act of 1879 if other alternatives are rejected and the reluctance of the patient to comply with the statutory provisions for admission can be overcome. The consequent restrictions may impress the patient with the importance of custodial care and encourage him to seek and persevere with treatment. There can be, of course, no objection to discharge the patient in appropriate cases before the full period of detention has expired.

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2. Legrain, M.: *Art. Dipsomania*, pp. 388 et seq. *Dictionary of Psychological Medicine*, D. Hack-Tuke, London, 1892.
3. *Alcohol: Its Action on the Human Organism*, London, 1923, p. 106.
4. *Criminal Statistics England and Wales*, 1933, London, 1935, p. 5.
5. *Report of the Commissioners of Prisons and Directors of Convict Prisons*, 1933, London, 1935, pp. 10 and 11.
6. *Annual Reports of the Inspector under the Inebriate Acts*.

MEDICAL TOUR OF MOROCCO.—On April 14th a party of medical men and their friends will leave for a tour of Morocco, which will include districts only recently colonised as well as the more usual sights. The party will return to Marseilles on April 21st. Further particulars may be had from Dr. R. Bernard, *Bruzelles-Médical*, 29, Boulevard Adolphe Max, Brussels.

MEDICINE AND THE LAW

Doctors and Dangerous Drugs

THE Home Office periodically circulates a list of medical practitioners, dentists, chemists, and veterinary surgeons from whom has been withdrawn the authority to possess, supply, or prescribe "dangerous drugs." The latest of these lists gives the names and addresses of 27 medical practitioners against whom the Secretary of State has made an order for this purpose during the past 14 years. The list states that in all but three cases a direction was simultaneously given that it should not be lawful for the named doctors to give prescriptions for the purposes of the Dangerous Drugs Regulations. Thus we get a summary of information (otherwise scattered over the arid columns of the *London Gazette*) as to the working of statutory control. The Act of 1920, giving permanent effect to certain war-time restrictions, confined the import, export, manufacture, sale, distribution, or supply of "dangerous drugs" to persons licensed or authorised. Home Office regulations, made under the Act, explain that certain classes of persons are authorised for this purpose—duly qualified medical practitioners, registered dentists, and veterinary surgeons and research workers in approved institutions in particular. This general "authority," however, does not entitle these privileged classes to possess or supply such drugs beyond what is "necessary for the practice or exercise of the respective professions or employments, in their capacity as members of their respective classes." Conviction for an offence under the Act of 1920 (or under the customs laws as applied by that Act) gives the Home Office a power to withdraw a person's "authority" by notice in the *Gazette*. If a doctor, dentist, or veterinary surgeon thus loses his "authority," the Home Office may, by like notice, direct that it shall not be lawful for him to prescribe dangerous drugs. It will be remembered that in 1926 a departmental committee on drug addiction considered and reported upon possible abuses discovered through the supply of exceptionally large quantities of morphine and heroin to particular practitioners or to individual patients on practitioners' prescriptions. The committee examined evidence tendered by the Home Office, the Ministry of Health, and the Director of Public Prosecutions, and considered possible remedies. It found the Home Office reluctant either to prosecute doctors in the police-court for offences against the Dangerous Drugs Acts or to bring such cases to the notice of the General Medical Council for disciplinary action. The reason for this reluctance was the fact that the issue would turn largely on questions of medical opinion. In the end the committee advised that these cases of alleged improper supply should, where the conduct of doctors was in question, be referred to a special medical tribunal. Regulations of 1928 gave effect to this suggestion and enacted that, if the tribunal so recommended, a doctor's "authority" might be withdrawn by the Home Office in consequence of adverse findings. It was a solution by no means unsatisfactory to the medical profession that the Home Office, accepting the advice of a departmental committee consisting entirely of physicians and surgeons, should have set up a medical tribunal to deal with these difficult allegations against professional men of possessing or supplying dangerous drugs for medical purposes which are not legitimate. So far as is known, no complaint is made of the manner in which the tribunal does its duty.

In relation to the huge total of medical practitioners on the Register, the number of 27 in the recent Home Office list is perhaps not a sensational proportion.

Murder by Bacillus

We must wait for the Indian mail to bring a full account of the judgment of the High Court in Calcutta on the appeal from the death sentences in the plague bacillus case. A rich Bihar land-holder was said to have died through plague infection injected into his body by a prick inflicted by a passing stranger in the waiting-room of a Calcutta railway station in November, 1933. Two men, the step-brother of the deceased and a doctor, were found guilty of conspiracy to murder. The Appeal Court has described the case as unique in the annals of crime. According to a telegram in the *Times* from its Calcutta correspondent, the death sentences were, on Jan. 10th, commuted to transportation for life partly because of the exceptional delay in hearing the appeal (the appellants having been under sentence of death for ten months) and partly because of the circumstantial nature of the evidence. It appeared that the two accused had conspired to provide some person at present unknown with plague culture which could not have been obtained except at Bombay. It is reported to have been an additional reason for commuting the sentences that this course may lead to the discovery of the actual perpetrator of the crime.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED
JAN. 4TH, 1936

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2438; diphtheria, 1227; enteric fever, 25; acute pneumonia (primary or influenzal), 1684; puerperal fever, 31; puerperal pyrexia, 132; cerebrospinal fever, 29; acute poliomyelitis, 2; acute polio-encephalitis, 1; encephalitis lethargica, 3; dysentery, 23; ophthalmia neonatorum, 56. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Jan. 10th was 3818, which included: Scarlet fever, 1102; diphtheria, 1188; measles, 397; whooping-cough, 528; puerperal fever, 17 mothers (plus 12 babies); encephalitis lethargica, 280; poliomyelitis, 3. At St. Margaret's Hospital there were 16 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox, 2 (1) from enteric fever, 48 (4) from measles, 6 (0) from scarlet fever, 21 (4) from whooping-cough, 39 (7) from diphtheria, 45 (12) from diarrhoea and enteritis under two years, and 110 (12) from influenza. The figures in parentheses are those for London itself.

The mortality from influenza is rising, the total deaths for the last five weeks (working backwards) being 110, 80, 67, 62, 45. They are scattered over 62 great towns, Manchester reporting 8, Birmingham 6, Liverpool 5, Blackburn, Leeds, Bristol, and Walsall each 3; no other great town more than 2. Liverpool reported 15 deaths from measles, Manchester 9, no other great town more than 2. Liverpool also had 6 deaths from whooping-cough. Deaths from diphtheria were reported from 25 great towns: Liverpool 6, Hull, Manchester, Newcastle-upon-Tyne each 2. Bradford reported the only death from enteric fever outside London.

The number of stillbirths notified during the week was 270 (corresponding to a rate of 38 per 1000 total births), including 53 in London.

SOCIETY FOR THE PROVISION OF BIRTH CONTROL CLINICS.—On Friday, Feb. 7th, at 6 P.M., Dr. Gladys Cox will give a lecture on the theory and practice of contraception, which will be followed at 7 P.M. by a practical demonstration. The lecture will be given at the Walworth Women's Welfare Centre, 153A, East-street, London, S.E. Tickets should be obtained in advance from the centre.

OBITUARY

**ALBERT ALEXANDER GRAY, M.D.,
F.R.F.P.S. Glasg.**

THE death on Jan. 4th at his home in the West Highlands of Dr. Albert Gray, at the age of 67 years, removes an otologist whose name was known to his fellow workers throughout the world.

Albert Alexander Gray was born at Pollokshields, Glasgow, son of William and Margaret Gray (née Pace), and was educated at Bootham School, York, Oliver's Mount, Scarborough, and Glasgow Academy, qualifying M.B., C.M. Glasg. in 1890. Within the next ten years he took the M.D. Glasg. and the fellowship of the Faculty, and was elected F.R.S. Edin. After a house surgeoncy at the Glasgow Royal Infirmary he spent two years in general practice in Blackburn and then

studied in Leipzig and Munich before returning to Glasgow to specialise in diseases of the ear, nose, and throat. He was appointed aural surgeon to the Central Dispensary and lecturer in the University on diseases of the ear, contributing regularly to the *Journal of Anatomy and Physiology*, so that even before his appointment as aural surgeon at the Infirmary he came to be recognised as an otological authority.



DR. ALBERT GRAY
(Photograph by Annan)

The story of Gray's career as an investigator is part of the history of scientific otology. His early work was designed to overcome the formidable technical difficulties still obscuring many fundamental questions of the ear's finer structure. His first major achievement was a notable improvement in the technique of preparing casts of the membranous labyrinth (1904). This method he proceeded to apply on a wide scale in those studies of the comparative anatomy of the inner ear, the fruits of which were seen in his first classic work, "The Labyrinth of Animals," published in 1908. The results therein presented display a mastery of histological and photographic technique which has remained unsurpassed to this day. By this early mastery of anatomical method Gray provided himself with a weapon the power of which was to be continuously demonstrated in the years to come. With the instinct of the true biologist, however, he regarded anatomy as no more than a means of attack upon problems of function. In 1900 he published his observations upon the differentiation in size and density of the spiral ligament of the cochlea, putting forward the theory of maximum stimulation which has stood the test of time. His views on the physiology of hearing are embodied in the "Mechanism of the Cochlea" (1924), written in collaboration with Mr. G. Wilkinson. His "Atlas of Otology" (1924 and 1933) displays the same technical perfection and sound biology. In the sphere of

pathology, apart from his pioneer study of the changes in deaf-mutism, Gray was chiefly known for his work on otosclerosis. His book with this title (1917) combined careful clinical observation and good pathological method in a way unusual at the time. His more recent work was set out in his Dalby lecture (1934), and the book on the treatment of otosclerosis published just before his death. Recognition of his standing as a scientific otologist came to Gray at many periods of his career: it included the Lenval prize of the International Congress of Otology (Budapest, 1909), the gold medal of the American Academy of Ophthalmology and Otology (1911), the Guyot prize of the University of Groningen (1929), and many others. He was elected president of the section of otology of the Royal Society of Medicine in 1914 and of the International Collegium Otolaryngologicum Amicitiae Sacrum in 1929.

Dr. Gray had married in 1892 Mabel Henderson by whom he had two sons, of whom the elder is now head master of Bootham School and the younger is in practice at Haslemere. On his wife's death in 1927 he gave up his work in Glasgow and retired to London where he became librarian and curator to the Ferens Institute of Oto-Laryngology at the Middlesex Hospital. Of his work there "S. H." writes: "Except for holidays in Scotland, Gray spent almost the whole of his time in the Institute, often remaining at work until well after midnight, because the freedom from traffic and vibration provided the best conditions for the high-power microphotography by which he illustrated most of his contributions. He soon became the father of the laboratory, his counsel and advice being constantly sought and freely given. He worked because he enjoyed working and his enthusiasm spread to all with whom he came in contact. He had in high degree the gift of exposition, making a difficult and technical subject both clear and interesting, and his demonstrations at the Institute and at meetings of the otological section and of the collegium were appreciated by all who heard them. Gray has done more than anyone in this country for scientific otology. He has demonstrated that the best, if not the only, line of advance lies in the careful study of deafness during life followed by high-power magnification of serial sections after death. It is greatly to be regretted that the valuable work on which he was still engaged should have come to this abrupt end."

JAMES WOOD, M.D. Manch., D.P.H.

Dr. James Wood, who died on Jan. 3rd at the age of 62, had been for some time in ill-health but continued to discharge his duties as M.O.H. for Chadderton until two years ago. Born at Oldham and educated subsequently at Wesley College, Sheffield, and the University of Manchester, he graduated as M.B., Ch.B. in 1896, and proceeded later to the M.D. degree, taking also the diploma of D.P.H. of the Irish royal colleges. After holding several resident appointments and being for a few years in private practice, he was appointed in 1911 assistant M.O.H. at Oldham. Two years afterwards he became M.O.H. of Chadderton, and discharged the duties to public satisfaction until a breakdown in health occurred in 1934. He was then given leave of absence and never resumed duty. Dr. Wood was known in the neighbourhood, in addition to his valuable public services, as a particularly fine cricketer.

RONALD GEORGE CANTI, M.D. Camb.

THE death after long illness of Dr. Canti, the well-known pathologist, occurred at his home in Hampstead on Jan. 7th. He was a pioneer in scientific research, a popular and effective teacher, and an untiring and unselfish worker. His death at the age of 52 is a matter of public regret.

Ronald George Canti was the son of Mr. G. F. Canti, and was born in London in 1883. He was educated at Charterhouse and entered King's College, Cambridge, in 1902. He received his medical training at St. Bartholomew's Hospital, took the English conjoint diploma in 1911 and graduated M.B. Camb. in 1915, proceeding later to the M.D. degree. At St. Bart.'s, after serving as house physician, he became a demonstrator of pathology under the late Sir Frederick Andrewes, the starting-point of a laboratory career which was to develop along lines which no one could then have foreseen. Overshadowed as they were by his subsequent achievements, his earlier contributions to knowledge included a number of useful and diverse studies, embracing such subjects as the urea content of the cerebro-spinal fluid, the morbid anatomy of pulmonary tuberculosis in childhood, and the bacteriological findings in cerebro-spinal fever. In connexion with these it should be observed that he was the first English worker to demonstrate that the urea content of the cerebro-spinal fluid rises with that of the blood, the first to

confirm Ghon's observation that tuberculosis of mediastinal glands is always secondary to a focus in the lung, and one of the earliest to recognise that meningococci identical with those causing a meningitis are to be found in the nasopharynx during the course of the disease.

The work by which Canti is best known began in association with the late T. S. P. Strangeways and centred on the behaviour of the malignant cell under irradiation. Over and above the pursuit of this study by in-vitro methods, he undertook with Dr. Malcolm Donaldson an exhaustive histological investigation of uterine carcinoma at various stages during and after irradiation, which is among the earliest and most thorough of its kind. But his principal achievement was in bringing the behaviour of tissue cultures within the range of ordinary vision. Direct observation could not be continued over such periods as are occupied by the process of growth in a tissue culture; photography could conceivably take its place, and photographs would not merely provide a permanent record, but if taken at long intervals and projected at the speed of cinema film would condense the protracted and sluggish events of perhaps three days' growth into an animated but nevertheless faithful reproduction lasting only a few minutes. The apparatus by which this result was in fact achieved, first built by Canti himself in his own house, was a marvel of ingenuity, and the technical excellence of its photography excited widespread admiration,

These films enabled many thousands who would never otherwise have had more than the vaguest conception of the individual living cell to gain a vivid idea of its activities. The potentialities of this method of observation have perhaps yet to be fully explored, but wherever tissue culture can serve the purposes of future research the machine devised by Canti will remain indispensable to its prosecution.

Among Canti's numerous other interests were his scientific secretaryship of the British Empire Cancer Campaign, which included the organisation of a highly successful conference in December, 1934, and his position as chief medical adviser to the London Blood Transfusion Service, an organisation which he helped very largely to bring to its present size and efficiency. His appointments included that of lecturer in bacteriology at St. Bart.'s, which he relinquished in 1930 to become clinical pathologist to the hospital and lecturer in clinical pathology, those of pathologist to the Alexandra Hospital, Swanley and to the Florence Nightingale Hospital, and of bacteriologist to the City of London. In the interstices of this public work he was a clinical pathologist enjoying a reputation in some ways unique for acumen and soundness of judgment, and for his capacity to apply the latest available methods to the problems of diagnosis and treatment.

Apart from his wide and diverse knowledge of many ancillary subjects, from engineering to pure

physics, the attribute which served Canti best in his principal achievements was a light-hearted courage in the face of technical difficulties which no living man can have equalled. Behind this was an insatiable curiosity and a catholic interest in all things biological. To him nothing seemed impossible, and he was ready to turn to account in the laboratory a new discovery in almost any sphere. His visit to New York in 1925 to learn a new technique for studying the bacteriology of influenza provided a fresh stimulus to a mind of rare enterprise, and contributed to that ultra-modernity of outlook which was prepared for anything in the cause of progress. This imaginative capacity and an almost boyish enthusiasm were the most striking qualities in a vivid personality. His enthusiasm spilled over to the work of others, and many junior colleagues are indebted to him for unsparing help and stimulating encouragement. Both in the laboratory and in his practice he was inexhaustibly generous when his services were needed. He had a wide circle of international as well as of home friendships; he will be remembered by all as a brilliant personality and a supreme technician, and by many as a most lovable friend.

Dr. Canti married in 1912 Clara Eyles, who nursed him throughout a long and distressing illness. He leaves four children: a daughter, a son who has followed his father to King's College, Cambridge, a second son who is a student at the Royal Veterinary College, and a third son who is a student at St. Bartholomew's Hospital.



DR. CANTI

JOHN GEORGE GRANT, L.R.C.P. Edin.

Dr. J. G. Grant, of Miavaig, Stornoway, who died on Dec. 26th, had been in ill-health for a long time and his premature death was directly connected with his arduous work as a medical officer in the Highlands and Islands medical service. He received his medical education at Anderson College, Glasgow, working also in Edinburgh and at the London Hospital, and took the double diplomas of Edinburgh and Glasgow in 1899. He practised for a time in Canada, but some 20 years ago he succeeded Dr. Donald Murray as M.O.H. for Stornoway and the parishes of Uig and Lochs, a district presenting great geographical difficulties to the practitioner. The discharge of his onerous duties, complicated by the bad conditions of transport, especially in winter, tried Grant, but relief was obtained by the division of his area during the latter part of his life. He was now responsible for West Uig only, while the opening of a new high road eased the water journeys. But by this time he had practically broken down under the strain, and a lingering invalidism led to his death at the age of 60.

MABYN READ, M.D., D.P.H. Camb.

Dr. Mabyn Read, whose death occurred on Jan. 2nd, was for many years M.O.H. for the city of Worcester. As he became connected with the public health of Worcester nearly half a century ago he saw the whole of modern sanitary administration develop in the cathedral city.

Born at Falmouth he went to Christ's College, Cambridge, as a natural science scholar, and graduated with honours in the Natural Sciences Tripos in 1876. He proceeded to St. Bartholomew's Hospital for his medical education, and graduated as M.B. Camb. in 1880, later taking the diploma of D.P.H. and the M.D. degree. He acted as house physician both at St. Bartholomew's Hospital and Great Ormond-street Children's Hospital, and in 1891 was appointed M.O.H. of Worcester; as this was, as usual at that date, a part-time appointment, for the first 20 years of his residence in Worcester Dr. Read carried on private practice, but in 1912 he became a full-time officer and held the post for 17 years, retiring in 1929. As will be seen by these dates, the main evolution of modern sanitation went on under his eyes and largely under his administration, the official care of infants, the school medical and tuberculosis services all being initiated during his term of office. He was particularly interested in maternity and child welfare activities, and was rewarded by seeing the infant death-rate of the city substantially reduced, a practical issue to his enthusiastic labours.

CLEMENT JOHN GOODHUGH WHITE, M.B., B.Chir. Camb.

THE sudden death occurred on Jan. 6th of Dr. John White, resident surgical officer at St. Bartholomew's Hospital, Rochester. He was found dead in the hospital in circumstances that necessitated an inquest, which has been adjourned in order that certain analyses may be performed.

C. J. G. White was the son of Dr. Clement White, honorary surgeon at St. Bartholomew's Hospital, Rochester, and was 27 years of age. He was educated at Felsted and Christ's College, Cambridge, where his father had been before him, and graduated in arts with honours in the Natural Sciences Tripos, proceeding for his medical education to the Middlesex

Hospital. He took the English conjoint diplomas in 1933, and graduated as M.B., B.Chir. Camb. in 1935. At the hospital he served as house physician and resident officer in the ear, nose, and throat, and in the orthopaedic departments, and in his work showed himself diligent, conscientious, and possessing sound judgment. His geniality and good nature combined with his clinical insight enabled him to fill his resident posts with unusual success, while his qualities as a sportsman further added to his popularity, for while at Middlesex he was secretary and captain of the hockey club. After leaving Middlesex Hospital he acted as obstetric and gynæcological house surgeon at Queen Mary's Hospital, Stratford, and then, after six months' experience as a ship's doctor, he obtained the post of resident surgical officer to St. Bartholomew's Hospital, Rochester. The reasons of his sudden death are now under inquiry, but none of the evidence given at the inquest pointed to anything but a fatal accident, for he was to all appearance a perfectly happy young man, successful in his career, in excellent health, and with no financial or other private trouble. We have received from the Middlesex Hospital medical school an eloquent tribute to his popularity at the Middlesex Hospital: "Jack White will always be remembered by those who knew him for his cheerfulness, good nature, enthusiasm, and other personal qualities which go to the making of a most kindly and understanding doctor."

JEREMIAH REIDY, M.D., D.P.H.

Dr. Jeremiah Reidy, who died on Jan. 6th at his home in Blackheath Park, practised in Stepney for 30 years, and was well known in both public and professional capacities.

Jeremiah Reidy was born at Gardenfield, Limerick, and was educated at University College, Cork, proceeding for his medical studies to Dublin and Glasgow. He took the double Scottish diploma in 1898 and attended classes at the London Hospital, after which he became clinical assistant at the Royal Eye Hospital, Southwark, the Royal Chest Hospital, and the Blackfriars Hospital for Diseases of the Skin. He then graduated as M.B., B.Ch. R.U.I., taking also the D.P.H. in 1912. Two years later he proceeded to the M.D. degree, when he secured the gold medal in medicine. He had now been established for some time in Stepney and was conducting a large practice, while he was also surgeon to the H Division of the Metropolitan and Thames Police. In the year 1917-18 he was mayor of Stepney and was appointed a J.P. of the County of London. In Dr. Reidy the profession has lost an able practitioner and the public a useful servant.

NEW HOSPITAL AT EAST GRINSTEAD.—East Grinstead's new hospital was opened on Jan. 8th by Princess Helena Victoria, and received its first patients on Jan. 14th. The hospital is situated on the East Grinstead-Holtze road, not far from the town, and it will meet the great need which has been felt for many years. It replaces the Queen Victoria Cottage Hospital which was opened as a memorial of a former Royal Jubilee, and which only contained 12 beds for adults, 3 cots for children, and one room for a paying patient. The new hospital, which cost about £29,000, has accommodation for 12 men, 12 women, 6 cots for children in their own ward, and 6 paying patients; it also contains an operating theatre, X ray room, and accommodation for the staff. After the opening ceremony and the dedication service conducted by the Bishop of Chichester, the Princess received purses from 150 children.

CORRESPONDENCE

THE CONTROL OF MEASLES

To the Editor of THE LANCET

SIR,—In his interesting paper in your last issue (p. 103) Dr. J. A. H. Brincker states that the first attempt to modify measles was made by L. Weissbecker 40 years ago. As a similar statement was made in an editorial article in the *Journal of the American Medical Association* of August 17th, 1935, it is well to emphasise the fact that inoculation against measles was first carried out nearly two centuries ago by Frances Home (1719–1813), first professor of *materia medica* in Edinburgh, who is best known for his “*Inquiry into Nature, Cause, and Cure of the Croup*” (1765). In an article in his “*Medical Facts and Experiments*” (1759), entitled *Of the Measles as they appeared 1758 and of their Inoculation*, Home wrote: “I thought that I should do no small service to mankind if I could render the disease more mild and safe in the same way as the Turks have taught us to mitigate the small-pox.” Home’s method was as follows: A superficial incision was made where the eruption of measles was thickest, and the blood was received on cotton-wool which was applied to incisions on both arms of the child to be protected and allowed to remain on three days. Of 12 children, aged from 7 months to 13 years, in whom this method was employed three had no rash at all and were regarded by Home as failures, though we should probably regard them as examples of complete protection, while in nine the attack was much milder than usual.

Home’s method was subsequently employed by observers in different countries with varying results. In 1789 Thomas Percival (“*Essays Medical, Philosophical, and Experimental*,” 1789, ii., 69), after alluding to Home’s method, stated that “the morbillous matter has since been ingrafted by means of lint wet with the tears from the eyes in the fresh stages of the disorder.” Percival however did not give any information as to the success of this experiment. Von Jürgensen (Nothnagel’s *Encyclopædia of Practical Medicine*, 1902, art. measles), who is sceptical as to the success of Home’s experiments, quotes Thomassen à Thuessink, who attended Home’s clinic in the Edinburgh Hospital in 1784–5, and failed to see the successful results described. According to Guersant and Blache (*Dictionnaire de Médecine*, 1832–1846, art. Rougeole) Home’s experiments were repeated at the Philadelphia Hospital in 1801 but without success, although trials were made with blood, tears, and nasal and bronchial mucus, and with a similar result by Locatelli. On the other hand, Prof. Speranza of Mantua (*Jour. der pract. Heilk.*, 1827, lxiv., 124) in 1822 inoculated six boys and himself, and a mild attack of measles resulted in each case. Home’s method, however, was carried out on the largest scale by a Hungarian physician, Michael von Katona (*Österreich. med. Woch.*, 1842, No. 29, p. 697), who stated that during a malignant epidemic of measles he had successfully inoculated 1122 individuals, 7 per cent. escaped an attack altogether, and in the rest it was very mild.

An interval of nearly 50 years elapsed between the publication of Katona’s paper and the appearance of another communication on the same subject. In a paper read before the Glasgow Medico-Chirurgical Society on March 21st, 1890 (*Glas. Med. Jour.*, 1890, xxxiii., 420), entitled *Inoculation, with sug-*

gestions for its further application in medicine, especially in mitigating the severity of measles, Dr. Hugh Thomson, vaccinator to the Faculty of Physicians and Surgeons, Glasgow, and to the Glasgow Royal Infirmary, after giving an account of Home’s, Speranza’s and Katona’s experiments, recorded his personal experience of two cases in which he employed Home’s method. As no eruption ensued, but only slight catarrhal symptoms, Thomson regarded his cases as failures, but like the three cases of Home previously mentioned they were probably examples of what would now be called an attenuated attack.

Further information about Frances Home will be found in a paper (*Proc. Roy. Soc. Med.*, 1927–8, xxi., 1013) by the descendant the late Fleet-Surgeon W. E. Home, a frequent contributor to your columns.

I am, Sir, yours faithfully,

J. D. ROLLESTON.

London, S.W., Jan. 11th.

GASTRIC ACIDITY AND ITS SIGNIFICANCE

To the Editor of THE LANCET

SIR,—Prof. F. L. Apperly’s paper on gastric acidity in your issue of Jan. 4th is of great interest, but some of his conclusions to which you refer in your annotation are certainly erroneous.

I have analysed the data obtained in a consecutive series of 41 anæmic patients at New Lodge Clinic who had both a blood count and a test-meal in the few days preceding a transfusion. No less than 33 secreted free hydrochloric acid, including 17 with acidity above normal. They included 21 cases of anæmia following hæmorrhage from an ulcer. Some of the others were cases of very chronic anæmia, including 1 of Hodgkin’s disease and 3 of aplastic anæmia. In one patient with aplastic anæmia, who has led a fairly active and comfortable life as a result of having about 250 transfusions in the course of eight years, hyperchlorhydria is still present, though his hæmoglobin rarely exceeds 50 and has been as low as 26 per cent. In seven cases the hæmoglobin percentage was under 30, in six between 31 and 40, in nine between 41 and 50, in seven between 51 and 60, and in the remainder between 61 and 66—all having a degree of anæmia which, according to Prof. Apperly, should give rise to achlorhydria.

Only 8 of the 41 patients had achlorhydria; of these 3 had Addison’s anæmia, 3 carcinoma of the stomach, 1 polyposis and carcinoma of the colon, and 1 microcytic anæmia which appeared to be a sequel of achlorhydria following gastro-jejunostomy. Certainly in 6 and probably in all of these cases the achlorhydria preceded the development of the anæmia. In an unselected series of 41 anæmic patients there was thus no single case which gives any support to Prof. Apperly’s statement that achlorhydria is likely to result when the hæmoglobin falls below 66 per cent. of the normal.

Prof. Apperly suggests that it is necessary to distinguish between achlorhydric anæmia and his hypothetical anæmic achlorhydria, but I believe that all cases in which anæmia is associated with achlorhydria the anæmia is either a result of the gastritis, which also causes the achlorhydria as in Addison’s anæmia (Faber, Castle), or the anæmia is a result of deficient utilisation of the iron in the food owing to the achlorhydria or the associated enteritis (Faber, Witts). Prof. Apperly also suggests that asthma will be found

to raise the gastric acidity. But Glanvill and Cosin found that in 15 of my cases at Guy's Hospital and 52 at New Lodge Clinic curves below the average normal occurred 20 per cent. more frequently than among normal people, 12 per cent. having achlorhydria. Marjorie Gillespie in a series of 109 asthmatic patients found that 51.5 per cent. had acidity below normal, compared with 19 per cent. of 2448 cases collected by Hartfall from New Lodge Clinic, and 15.5 per cent. had achlorhydria. Low acidity is still more frequent among children; thus Bray found that 9 per cent. of 200 children had achlorhydria, 48 per cent. hypochlorhydria, and 23 low normal curves. I am, Sir, yours faithfully,

ARTHUR F. HURST.

New Lodge Clinic, Windsor Forest, Jan. 11th.

MATERNITY NURSES AND MIDWIVES

To the Editor of THE LANCET

SIR,—In your issue of Nov. 16th, 1935, appeared a letter from Dame Janet Campbell in which various problems connected with the proposed salaried midwifery service were offered for solution. Among these, the most urgent would seem to be: How are the competing claims of the medical student and pupil midwife for the use of clinical facilities to be reconciled? When medical authorities are urged to improve the training in obstetrics of medical students, they invariably reply that the chief obstacle is the comparative scarcity of material, the cases which they so greatly need being absorbed by the training of over 3000 pupils annually, for the Central Midwives Board examination. Of these, more than 50 per cent. do not propose to practise midwifery, and the experience to be gained by, at the lowest computation, 30,000 of these all-important maternity cases is being thrown away on candidates already dedicated to a totally different branch of service.

A medical student and a pupil midwife may not count the same case in their obligatory roll of 20. This rule does not, for obvious reasons, apply to the training of maternity nurses. If, therefore, as Dame Janet suggests, England were to copy the example of Holland—already well ahead of her in this matter—and were to institute a registered service of maternity nurses, the legitimate aspirations of our hospital nurses, to learn how to care for mothers and their infants during and after childbirth, would be satisfied, and the gain to medical students and pupil midwives greater than is at present realised. Simultaneously, the training of the latter might with advantage be lengthened to a two years' course—already current in many, if not most, European countries. This would automatically reduce the number of midwifery pupils to a very large extent, their place being taken in hospital wards by the pupil maternity nurses.

In Holland maternity nurses who already possess State registration for general nursing are allowed to take a six months' course, twelve months being prescribed for those without this qualification, and this has been proved to answer admirably. It is sometimes urged that the only way to abolish the dangerous "handy woman" is to penalise the care of motherhood to all but certified midwives, but it is obvious that a class of registered maternity nurses would answer the same purpose, perhaps even more effectually.

I am, Sir, yours faithfully,

ALICE S. GREGORY,

Hon. Secretary, British Hospital for Mothers and Babies, Woolwich.

Jan. 13th.

WHOOPING-COUGH AND VACCINE

To the Editor of THE LANCET

SIR,—I should like to thank Dr. Begg and Dr. Coveney for the way in which they have, in your issue of Jan. 11th, set out the data of their vaccine treatment of whooping-cough. Sufficient details are given to enable the reader to criticise. Often enough no notes of dose or preparation of vaccine are given, so that when failures are reported, one is left wondering whether it was indeed the vaccine which was at fault.

Knowing nothing of the vaccine treatment of whooping-cough, I assume that it can be compared to that of any other disease of a mildly chronic type, a disease, moreover, which may begin acutely and then pass through a subacute stage. The authors of the above paper make the following statement: "It is generally agreed that, if success is to follow vaccine therapy, the initial injections must be given early in the disease, large doses must be injected. . . ." Treatment along these lines is justified, as has been shown by W. H. Wynn (Brit. Med. Jour., Jan. 11th, 1936) in his treatment of pneumonia, but large doses may only be given before the patient is sensitised to pneumococci, which, according to Wynn, begins to happen on the fourth or fifth day. On their own showing, however, the whooping-cough cases treated by Dr. Begg and his colleague had already reached the paroxysmal stage of the disease. In order to justify the large doses of vaccine used, it would be necessary to show that no specific antibodies had already been formed—i.e., that the cells had not become sensitised. In any case, the doses advocated by Wynn (60 to 600 million) are less than a twentieth of those given to the children (all under the age of ten).

A few years ago I made some estimations of the dried weight of bacterial vaccine. Roughly 4000–5000 million dried coliforms weighed 1 mg., or 5000–6000 million streptococci or staphylococci. Probably the very small *B. pertussis* might run to higher figures, but certainly not more than 8000 million. Drs. Begg and Coveney in 14 days gave children doses up to 2 mg. and, in all, the equivalent of 6 mg. of dried bacterial substance. Compare this with tuberculin, as Wynn aptly does in the paper quoted above; 1 c.cm. (containing 1 mg. ?) would not affect a normal child, but 0.000001 c.cm. might cause reaction in an infected person. Translated into terms of pertussis vaccine:—

Eight thousand million to a normal person = reaction —
Eight thousand only to an infected person = reaction ±

Comparable too with tuberculosis is the vaccine treatment of chronic rheumatism. At the Charterhouse Rheumatism Clinic, in order to minimise reaction, amounts varying from under 1000 up to about 200,000 organisms are given. This range of dosage was also recommended by the B.M.A. committee on arthritis, when referring to my vaccine. For estimating dosage, perhaps we may assume that whooping-cough in the paroxysmal stage lies between the extreme of acute pneumonia on the one hand and chronic arthritis on the other. Optimum doses might reasonably be considered to range from (say) 50,000 to 500,000 or one million. Drs. Begg and Coveney envisage a further investigation. Let them try such a range and use their present method as a control.

To the unbiased reader the surprising thing is that the vaccine cases so closely approximated to the controls. Here must have supervened the mechanism which a merciful Providence seems to have provided whereby the reaction from a heroic dose of vaccine

can only be the maximum and that any bacterial substance in excess of the amount necessary to provoke this does no further harm, beyond perhaps immediately neutralising the antibodies produced.

I am, Sir, yours faithfully,

London, W., Jan. 13th. H. WARREN CROWE.

THE UNDESCENDED TESTICLE

To the Editor of THE LANCET

SIR,—I have been discussing the question of medical and surgical undescended testicles with Dr. Spence and Dr. Scowen, and we have decided to break away from professional tradition and have a look at some of each other's cases. I hope to convince them that the arguments on which I submit cases to operation are not entirely irrational, and that the results are much better than they imagine them to be. On the other hand, if they convert a case for which I should recommend operation into one for which I should not, I shall most willingly admit it as a postscript to their next report.

I am, Sir, yours faithfully,

Queen Anne-street, W., Jan. 13th. DENIS BROWNE.

A VASOVAGAL ATTACK

To the Editor of THE LANCET

SIR,—I was interested in Dr. Gumpert's note published in to-day's issue of THE LANCET because I recently had a similar experience.

A middle-aged patient was brought to me on Dec. 21st, 1935, by Mr. J. Ross McNeill, of Norbury, with a history of fainting attacks associated with bradycardia. Just as I was preparing to take a tracing he suddenly had a faint, and the electrocardiogram, as in Dr. Gumpert's case, showed a slow rhythm (40) with complete absence of P-waves. A second tracing taken about a quarter of an hour later showed a normal rhythm.

I am, Sir, yours faithfully,

Queen Anne-street, W., Jan. 11th. T. W. PRESTON.

A BOOK REVIEW

To the Editor of THE LANCET

SIR,—I have read with much interest the review (THE LANCET, Nov. 23rd, 1935, p. 1183) of the new edition of Jelliffe and White and especially the remark that too great a proportion of the book has been given to the vegetative nervous system (suprarenals et al.) as compared with neurosurgery, for example, i.e., tumours of the spinal cord, radiography, &c. Dr. White and I believe that suprarenal difficulties are strictly neurological problems; especially asthenic states are more frequent and important than spinal cord tumours, hence a greater space is given to them. One of our special problems was this statistical one of proportionate involvement of this or that organ or organic function—i.e., disease—and we have tried to follow such a balanced programme in our book.

We think your reviewer distinctly in error when he says we give only "six words" to the subject of encephalography in the diagnosis of cerebral tumours, no doubt referring to the six words on p. 785. How about the 20 words on p. 778? and I might refer to a number of places throughout the book where Röntgen ray methods are emphasised. As this work is not one on neurosurgery this type of special study is naturally only mentioned as desirable or necessary. The roentgenologist does most of the film interpreting for spinal cord tumours, brain tumours, &c.

When further your reviewer states that "subacute combined sclerosis" is not clearly differentiated from a motley group of "combined scleroses," is this true? And when he says it is "mainly in the realm of recent

developments in neurology that the shortcomings of the book are to be found," would it not have been of service and as evidence of good faith to mention some of these that are omitted?

I am, Sir, yours faithfully,

New York, Dec. 20th, 1935. SMITH ELY JELLIFFE.

OEDEMA OF THE ANKLES AND AIR TRAVEL

To the Editor of THE LANCET

SIR,—On a recent visit to England by air I was rather startled to find that by the time we had reached Brindisi my ankles had become very œdematous. I was feeling at the time particularly fit and there was no sign of any renal or cardiac mischief. On inquiring from my fellow travellers, I was relieved to find that the majority also had some degree of œdema of the ankles. Moreover, not all the passengers had started from Johannesburg. Some of them had joined up in British East Africa and the Soudan. The œdema passed off after the first few days in London, but on the return trip my ankles again became œdematous. Inquiry also showed that some of the other passengers again had œdematous ankles. As quite a number of the passengers on the return trip were non-English speaking, it was difficult to get percentages or details of their physical conditions. Several of the pilots whom I questioned informed me that their ankles did not become œdematous. The most likely explanation for the œdema is that in the heat of the tropics the prolonged inactivity, with dependent position of the legs, causes stasis.

I am, Sir, yours faithfully,

Johannesburg, Dec. 29th, 1935. M. WEINBREN.

INFIBULATION

To the Editor of THE LANCET

SIR,—I should like to add a little to what was written by Mr. John M. Melly in your issue of Nov. 30th, 1935, about female circumcision, under the title infibulation, which is very popular in Egypt, not less than 80 per cent. of our girls being submitted to it. No one can give a date when this habit started, but it is now so adhered to by all classes of Egyptians as to be regarded as shameful to leave a girl uncircumcised.

The operation is done usually by old women who have gained a wide experience through long practice. As Mr. Melly says, the girl is usually about the age of 7 years, but may be much older; some are circumcised just before marriage, others after they have given birth to their first child. The way in which it is done in Egypt seems to differ from that in Somaliland because here its only purpose is to lessen desire, not to create a physical obstruction to intercourse. Some, however, believe that it is a form of toilet to the external genitals. The clitoris and the labia minora are removed in one sweep of a razor, ethyl alcohol and sometimes brandy being used for asepsis before the operation and to secure hæmostasis afterwards. No stitches are applied and no anæsthetic is used. The girl's legs are not bound together and the stump of each labium heals separately. Sometimes cases are referred to hospital with severe bleeding from the dorsal artery of the clitoris, for which we ligature the stump of the clitoris; occasionally one meets with retention of urine, relieved by a hot hip bath. I have never seen any cases of sepsis. The raw surface mostly heals by first intention; if infection occurs, it must be very rare.

I am, Sir, yours faithfully,

B. GIRGIS,

House Surgeon, King Fouad 1st Children Hospital,
Jan. 3rd. Cairo, Egypt.

TESTIMONIAL TO DR. ROWLAND FOTHERGILL

To the Editor of THE LANCET

SIR,—For over 33 years Dr. E. R. Fothergill has been prominent in British Medical Association affairs, and there are few members of the Association who are better known to those who take an interest in it. First in Wandsworth, then in Brighton, he has been an indefatigable local worker. For 22 years he has been a member of the representative body, for 25 years on the council, and for 22 years a representative on the panel conference.

It is impossible in the limits of this letter to detail the extent and importance of Dr. Fothergill's voluntary services to the medical profession through the Association, but his work on the Insurance Acts Committee and on the body which preceded it, and also on the Hospitals and Medico-Political Committees stands out pre-eminently. It was he who suggested and promoted the first conference of local medical and panel committees at Brighton in 1913, which led to the adoption by these committees of the British Medical Association as the body to which they should look for central organisation and support. His fertility of ideas, his persistence, and his loyalty to principle and to the interests of the Association have justly given him a unique position in it which was recognised in 1931 by his election as a vice-president. His advocacy at all times of the dignity and the rights of the medical practitioner is well known.

In recent years he has been compelled by reasons of health to give up general practice, and this has severely strained his resources. This seems to us therefore an appropriate time to give to the members of the profession an opportunity to mark in a tangible way their appreciation of Dr. Fothergill's work, and of the sacrifices he has made in doing that work.

We hope for a prompt and generous response to this appeal, not only from individuals but from local medical and panel committees. Subscriptions should be sent to the treasurer, Fothergill Testimonial Fund, B.M.A. House, Tavistock-square, W.C.1.

We are, Sir, yours faithfully,

HELEN BOYLE (Hove)	DAWSON OF PENN
A. C. GEMMELL (Hove),	(London),
DONALD HALL (Hove),	J. D'EWART (Manchester),
H. NETHERSOLE FLETCHER	W. McADAM ECCLES
(Hove),	(London),
L. A. PARRY (Hove),	C. E. S. FLEMMING
J. ARMSTRONG (Ballymena,	(Bradford-on-Avon),
Antrim),	N. BISHOP HARMAN
J. W. BIGGER (Dublin),	(London),
R. A. BOLAM (Newcastle-	C. O. HAWTHORNE
on-Tyne),	(London),
J. W. BONE (Luton),	E. KAYE LE FLEMING
H. B. BRACKENBURY	(Wimborne),
(Hendon),	EWEN MACLEAN (Cardiff),
R. C. BUIST (Dundee),	HUMPHRY ROLLESTON
A. H. BURGESS	(Haslemere),
(Manchester),	H. S. SOUTTAR (London),
ALFRED COX (London),	W. E. THOMAS (Ystrad-
H. G. DAIN (Birmingham),	Rhondda).

Jan. 13th.

THE VOLUNTARY HOSPITALS COMMISSION

THE first meeting of the new commission was held on Wednesday at the headquarters of the British Hospitals Association with Lord Sankey presiding. It will be remembered that the appointment of such a commission was resolved at the annual conference of the B.H.A., held at Leamington in June, 1935, with the instruction to consider the present position of the voluntary hospitals and to inquire whether recent legislative and social developments had made it desirable to take steps whether to promote their interests, to develop their policy, or to safeguard their future. The commission consists of the following ten members: Lord Cozens-Hardy; Alderman Miss H. Bartleet, J.P.; Sir Henry Brackenbury, M.D.; Alderman Alan Davies, J.P.; Prof. L. S. Dudgeon, F.R.C.P.; Mr. H. L. H. Hill; Colonel D. J. Mackintosh, M.B.; Miss E. M. Musson, R.R.C.; Sir Reginald Poole; Prof. A. W. Sheen, F.R.C.S. It will be seen to be of a highly representative character, including experts on nursing, accountancy, and legal procedure, besides men and women who know the technique of hospital administration inside and out and who have been in touch with problems of amalgamation and association. Lord Cozens-Hardy has already done for Liverpool hospitals what it is now proposed to do for the hospitals of the country; he found twenty different hospitals with similar interests, but with no single body authorised to speak on behalf of them all; and the matter has been put right. The problems have been well stated by Sir Charles Harris in the *Nineteenth Century and After* for May, 1935. In the general stocktaking of the position which is now necessary he instanced (1) the working relations which should exist between different units and especially the proper functions of the cottage hospital; (2) the question of modifying the time-honoured principle of unpaid visiting staffs; (3) economy in hospital administration and better team-work in general. If the voluntary principle is to hold its ground it is necessary, he said, for its adherents to demonstrate that in these as in national matters the intelligent coöperation of free men can achieve better results than bureaucracy or any form of dictatorship. The conundrum of to-day is to create voluntarily a machinery for effective combined action before it is too late; for, as Prof. W. Blair-Bell pointed out in the September issue of the same journal, the extraordinarily rapid march of State service in five years leaves no doubt of the urgency of the matter. Any person or body desiring to give evidence before the commission should communicate with the secretary, Mr. R. H. P. Orde, at 12, Grosvenor-crescent, London, S.W. 1.

IRELAND

(FROM OUR OWN CORRESPONDENT)

A "PROTECTED" MEDICAL SERVICE

IT is stated that the Ministry of Home Affairs for Northern Ireland has issued a circular to local authorities intimating that medical practitioners who in future seek positions as dispensary medical officers in Northern Ireland must be of British parentage, and must have at least five years' residential qualification in Great Britain or Northern

ROYAL MEDICAL BENEVOLENT FUND SOCIETY OF IRELAND.—At a meeting of the Belfast and County Antrim branch of this society on Jan. 8th a unanimous resolution was passed expressing thanks to Dr. V. G. L. Fielden for his invaluable services as honorary secretary and treasurer for the past 28 years. Dr. Robert Marshall was appointed Dr. Fielden's successor, and future subscriptions should be sent to him at 9, College-gardens, Belfast.

Ireland. From the newspaper reports it is not clear whether the Minister has framed a regulation to this effect, or has merely intimated that unless his wishes are met by the local authorities he will refuse his sanction to those whom they elect. Hitherto throughout the area of the British Isles—both before and since the establishment of the Irish Free State as a dominion—the appearance of the candidate's name in the register of the appropriate area, without reference to either birth or residence, has been the only qualification required for public appointments. The establishment of a medical register for the Irish Free State did not impose any bar, since any medical man holding British qualifications can enter his

name on that register, and conversely anyone holding Irish Free State qualifications can enter his name on the register of the General Medical Council. As a matter of fact in recent years there must be very few medical men, other than those with local ties, who seek to enter the dispensary service in Northern Ireland as the service is less well paid than in the Irish Free State. It would be unfortunate if this decision were to give rise to retaliatory measures on the part of the Irish Free State. Many of the most capable officers in all branches of the public service in the Irish Free State are in fact natives of Northern Ireland, and particularly is this the case in the recently appointed public health service.

MEDICAL NEWS

Royal College of Surgeons of England

A meeting of the council of the college was held on Jan. 9th with Sir Cuthbert Wallace, the president, in the chair, at which a report was received from the board of examiners in anatomy and physiology for the fellowship stating that, at the examination held in December, 228 candidates were examined, of whom 70 were approved and 158 rejected, that the Hallett prize was awarded to Robert Sutherland Lawson, of the University of Melbourne. At the recent primary fellowship examination held in Calcutta, 54 candidates were examined, of whom 12 were approved.

It was reported that Mr. F. H. Bentley and Dr. David Slome had been elected Mackenzie-Mackinnon research fellows for one year. Mr. Hugh Lett was appointed Bradshaw lecturer for the year 1936, and Dr. George W. Corner, professor of anatomy in the University of Rochester, U.S.A., was appointed as the next Thomas Vicary lecturer. Mr. L. R. Braithwaite was elected representative of the college on the medical advisory committee of the British Health Resorts Association for one year, and Mr. Victor Bonney was re-elected representative on the Central Midwives Board.

A diploma of fellowship was granted to Kenneth Christie Eden, of University College Hospital, and the following diplomas were granted jointly with the Royal College of Physicians of London:—

Tropical Medicine and Hygiene: W. K. Cheng, Anastasio D'Souza, J. S. Gibson, Kalidas Mitra, and V. T. Vagh.

Psychological Medicine: J. L. Bates, A. J. Galbraith, J. F. Galloway, S. L. Last, S. A. MacKeith, W. H. McMenemy, K. R. Masani, J. A. Smeal, Alfred Torrie, Rosalind Vacher, and J. H. Watkin.

Laryngology and Otology: B. T. Bernstein, G. B. Ludlam, R. F. J. Martin, Narayana Srinivasan, T. G. Swinburne, and W. E. Williams.

The following hospitals were approved, with the posts specified, for the six months' surgical practice required of candidates for the final fellowship examination:

Warneford, Leamington, and South Warwickshire General Hospital, Leamington Spa (resident house surgeon till July 31st, 1937); Manchester, Victoria Memorial Jewish Hospital (resident surgical officer); Newcastle Hospital, New South Wales (resident medical officer, 1 house surgeon, surgical registrar and superintendent); Southend-on-Sea General Hospital (surgical registrar, 2 house surgeons); Sunderland Royal Infirmary (resident medical officer, 4 house surgeons); the Royal Hospital, Wolverhampton (resident assistant surgeon, surgical registrar, and 3 house surgeons).

Medical Research Scholarships

The Grocers' Company Scholarships.—To encourage original medical research the Grocers' Company offer three scholarships, each of £300 a year. The next election will be held in May, but applications should be sent to the clerk, Grocers' Hall, London, E.C.2, before the end of April.

Aldrich-Blake Travelling Scholarship.—The trustees of the Aldrich-Blake memorial fund will shortly award a travelling scholarship to a medical woman. Applications should be sent to the secretary of the trust, 8, Hunter-street, London, W.C.

Further particulars of both these awards will be found in our advertisement columns.

University of London

At University College, on Mondays from Jan. 20th to Feb. 24th, Mr. H. R. Ing, Ph.D., will lecture on chemical structure and pharmacological action, and on Tuesdays, beginning on Jan. 21st, Mr. G. P. Wells will give ten lectures on comparative physiology. All the lectures will be at 5 p.m., and no ticket is needed.

Prof. C. R. Harington, F.R.S., has been appointed acting director of the Charles Graham medical research laboratories at University College Hospital medical school, and Dr. A. M. H. Gray, chairman of the Graham Legacy committee.

International Congress of Physical Medicine

The sixth international congress of physical medicine will be held in London from May 12th to 16th. The meetings of the congress will be held under the following sections: kinesitherapy, physical education, hydrotherapy and climatotherapy, electrotherapy, actinotherapy, and radiotherapy and radium therapy. The hon. secretary of the British section is Dr. Albert Eidinow, 4, Upper Wimpole-street, London, W. 1.

London School of Hygiene

A course of lectures on public health, open to all medical practitioners, is in progress at the London School of Hygiene and Tropical Medicine, Keppel-street, W.C. At the next lecture, at 3 p.m. on Jan. 22nd, Dr. W. G. Savage will discuss bovine tuberculosis, and on Jan. 31st and Feb. 7th, at 11 a.m., Mr. H. E. Magee, D.Sc., will speak on nutrition. Other subjects in the course are venereal disease (Col. L. W. Harrison, Feb. 5th, 10th, and 12th, at 3 p.m.), infant feeding (Dr. A. G. Maitland-Jones, Feb. 14th, at 11 a.m.), food poisoning (Dr. W. G. Savage, Feb. 21st, at 11 a.m.), shell-fish (Prof. J. W. H. Eyre, March 9th, at 3 p.m.), and the marketing of fish and production of clean milk.

Royal Medical Benevolent Fund

This is the centenary year of the fund and a special appeal is being made for new subscribers to carry on the work and for donations. At a recent meeting of the committee 64 grants were voted amounting to £1329. The following particulars of a few of the cases helped indicate the kind of work undertaken.

Daughter, aged 73, of M.R.C.S. She has lived for many years in Italy lecturing and acting as guide to English visitors in Rome. Owing to the prospect of there being less work in the future she has decided to leave Italy. On her arrival in England she will have only £70 per annum to live on. Fund voted her an allowance of £36 per annum.

Daughter, aged 52, of M.R.C.S., who used to look after her mother, aged 87, who is also a beneficiary of the fund, and take paying guests; owing to a recent breakdown in health is unable to continue this work. The fund by contributing £68 (of which £26 is an allowance to the daughter) has raised the income of these two ladies to £137 per annum.

Daughter, aged 79, of a naval surgeon, maintained herself until eight years ago in the nursing profession. She then joined her sister and was able to manage till her sister's death recently. Although now living rent free this lady has only the old age pension of 10s. a week. The fund voted an allowance of £36 and will consider what further help may be needed.

Cheques should be addressed to the honorary treasurer, of the fund, 11, Chandos-street, Cavendish-square, London, W. 1.

Scottish Board of Control

Dr. Francis Sutherland has been appointed a deputy commissioner of the General Board of Control for Scotland.

National Hospital for Diseases of the Heart

A course of lectures, open to members of the medical profession, without fee, will be given at this hospital at 5.30 P.M. on Tuesdays from Feb. 4th to April 28th. The lecturers and their subjects will be announced weekly in our Medical Diary.

Conference on Social Work

The third International Conference on Social Work will be held at Bedford College, Regent's Park, London, N.W., from July 12th to 18th. The general subject of the meeting is social work and the community. Dr. René Sand, counsellor of the League of Red Cross Societies, is president of the executive board of the permanent committee, and Dr. Ralph Crowley, formerly senior medical officer of the Board of Education for England and Wales, is chairman of the advisory committee in Great Britain. The secretary-general is Mr. Alexander Farquharson, Le Play House, 35, Gordon-square, London, W.C.1.

Fellowship of Medicine and Post-Graduate Medical Association

The following courses will be given in February: in proctology at the St. Mark's Hospital (Feb. 3rd to 8th); in neurology at the West End Hospital for Nervous Diseases (Feb. 3rd to 8th); in chest diseases at the Brompton Hospital (Feb. 10th to 15th); and in gynecology at the Chelsea Hospital for Women (Feb. 10th to 22nd). A week-end course in physical medicine will take place at the St. John Clinic and Institute for Physical Medicine (Feb. 8th and 9th) and in children's diseases at the Princess Elizabeth Hospital (Feb. 22nd and 23rd). A series of lecture-demonstrations in anatomy and physiology, specially intended for F.R.C.S. (primary) candidates, will be given at the Infants Hospital at 8 P.M. on Mondays, Wednesdays, and Fridays from Feb. 24th to April 24th. For further particulars application should be made to the secretary of the fellowship, 1, Wimpole-street, London, W.1.

Births, Marriages, and Deaths**BIRTHS**

- BRIGG.—On Jan. 10th, at Chipping Norton, the wife of D. A. Brigg, M.B., B.S. Lond., of a son.
MARSHALL.—On Dec. 29th, 1935, at Sheffield, the wife of Dr. G. G. Marshall, of a son.
SHERIDAN.—On Jan. 1st, at Greenock, Scotland, the wife of Captain A. M. Sheridan, I.M.S., of a son.
WILCOX.—On Jan. 5th, at Lilongwe, Nyasaland, the wife of Dr. R. N. Wilcox, of a son.

MARRIAGES

- MORRAH—DAY.—On Jan. 9th, at All Saints', Foots Cray, Michael C. M. Morrah, only son of the late Major J. H. Morrah, The King's Own Regiment, to Catherine Day, M.B., B.S. Lond., of Sidcup, Kent.
OLIVER—MICHIE.—On Jan. 4th, at St. Andrew's, Frogmal, N.W., Surg.-Lieut. John Widdicombe Oliver, R.N., to Isabel Margaret, elder daughter of Mr. Charles E. Michie Finchley, N.
SPRIGGS—MACINTOSH.—On Jan. 14th, at St. John's Parish Church, Perth, Sir Edmund Spriggs, K.C.V.O., M.D., F.R.C.P., to Miss J. M. MacIntosh, eldest daughter of the late William MacIntosh, M.V.O., and Mrs. MacIntosh. The Old Parsonage, Dunning, Perthshire.
WILLIAMSON—GIBSON.—On Jan. 10th, at the Chapel of the Savoy, Bruce Williamson, M.D. Edin., to Margaret, only daughter of the late William Gibson and Mrs. Gibson, Egerton-terrace, S.W.

DEATHS

- BALL.—On Jan. 7th, the result of a motor accident, Dr. Norman Dyer Ball, younger son of the late James Dyer Ball, of Hong-Kong, and husband of Dr. Doris Bell Ball.
CANTI.—On Jan. 7th, at Ilampstead, Ronald George Canti, M.D. Camb., aged 52.
FISHER.—On Dec. 30th, 1935, Walter Fisher, M.R.C.S. Eng., of Kalem Hill, N. Rhodesia, for 46 years a medical missionary in Central Africa, aged 70.
MATTHEW.—On Jan. 11th, at Craigmakerran, Perthshire, Charles Geekie Matthew, M.B. Edin., Surg.-Capt. R.N. (retired).
SAUNDERS.—On Jan. 12th, at Pembroke Dock, Edward Argent Saunders, M.R.C.S. Eng., M.O.H. and school medical officer, Borough of Pembroke, aged 50.
WYLIE.—On Jan. 7th, at a nursing-home, Oxford, David Thomas Wylie, M.D. Durh., of Oxford, aged 73.

N.B.—A fee of 1s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE SERVICES**ROYAL NAVAL MEDICAL SERVICE**

Surg. Comdr. A. G. Bee to *Defiance*.
Surg. Lt.-Comdr. J. G. Holmes to *President* for course.
Surg. Lt.-Comdr. (D.) A. A. Gardner to *Drake* for R.N.B.
Surg. Lts. J. L. S. Steele-Perkins to *Victory* for R.N.B., N. S. Hepburn to *Gannet*, T. McCarthy to *Furious*, D. W. Walker to *Pembroke* for R.M. Infirmary, Deal, M. A. Rugg-Gunn to *Pembroke* for R.N. Hosp., Chatham, and T. F. Crean to *Pembroke* for R.N.B.
Surg. Lt. (D.) W. G. Finnie to *Ganges*.
Appointments as Admiralty Surgeon and Agent: Mr. J. M. Stuart, Ilford; Mr. A. S. Addison, M.C., Harrow; Mr. J. A. Edward, Barking; Mr. J. R. Buchanan, Watford; Mr. R. Vincent Howell, Bournemouth; and Mr. P. N. Grinling, Sheffield.

ROYAL ARMY MEDICAL CORPS

Major-Gen. O. L. Robinson, C.B., C.M.G., Colonel Commandant, R.A.M.C., will be Representative Colonel Commandant during 1936.
Short Service Commissions: Lts. R. H. Wheeler and J. J. C. Rainsbury to be Capt.

ARMY DENTAL CORPS

The name of Capt. O. E. Howell is as now described and not as shown in the *London Gazette* of Dec. 27th, 1935 (*vide* THE LANCET, Jan. 4th, 1936, p. 42).

TERRITORIAL ARMY

Hon. Maj.-Gen. Sir Cuthbert S. Wallace, K.C.M.G., C.B., relinquishes the appt. of Hon. Col. R.A.M.C. Units, 47th (2nd Lond.) Div.

Lt.-Col. and Bt. Col. A. R. Laurie, from Gen. List, R.A.M.C., to be Col., and is apptd. A.D.M.S., 46th (N. Midland) Div., vice Col. F. G. Lescher, M.C., vacated.
Maj. T. E. A. Carr to be Lt.-Col. and to comd. the 137th (N. Midland) Fd. Amb., vice Lt.-Col. and Bt. Col. A. R. Laurie, vacated.

Cpts. R. Pollok and H. S. Ward to be Maj.
M. K. Braybrooke to be Lt.
Supernumerary for Service with O.T.C.: Lts. L. C. Bousfield and N. Heath (empld. Univ. of Lond. Contgt. (Med. Unit), Sen. Div., O.T.C.) to be Capt.

ROYAL AIR FORCE

Squadron Leader T. J. X. Canton to No. 1 Flying Training School, Leuchars, for duty as medical officer.
Flight Lt. H. C. S. Pimblett to R.A.F. Hospital, Cranwell.
Flying Officer J. B. Wallace to No. 10 Flying Training School, Ternhill.

INDIAN MEDICAL SERVICE

Majs. to be Lt.-Cols.: C. M. Nicol and D. R. Thomas, O.B.E.
To be Lts. (on prob.): W. McN. Niblock, H. J. Gibson, P. A. Hubbard, T. P. Mulcahy, F. E. McLaughlin, and E. H. Wallace.

The undermentioned have vacated appts. in India:—
A.D.M.S.—Col. E. C. Hodgson, D.S.O., K.H.P., I.M.S.
D.A.D.P.—Capt. J. R. Dogra, M.D., I.M.S.
The undermentioned appts. have been made in India:—
A.D.M.S.—Col. R. P. Lewis, D.S.O., Brit. Serv.
D.A.D.P.—Capt. S. S. Bhatnagar, M.D., I.M.S.
Col. A. C. Amy, D.S.O., is vacating the appointment of Deputy-Director of Hygiene and Pathology at Army H.Q., and proceeds on eight months' leave from Feb. 17th.

DEATHS IN THE SERVICES

The death occurred on Jan. 11th, at Craigmakerran, Perthshire, of Surg.-Captain CHARLES GEEKIE MATTHEW, R.N., retired. He qualified M.B., C.M. Edin., 1885, and was then for a time in the P. and O. Steam Navigation Company's service at Edinburgh, later joining the Royal Navy. As surgeon of *Sparrow* he was present on August 27th, 1896, at the bombardment and capture by Rear-Admiral H. H. Rawson's squadron of the Sultan of Zanzibar's palace which had been seized by Seyyid Khaled. He became Surg.-Commander in 1905, and Surg.-Captain in 1918, after his retirement from the Service.

Sir James Purves-Stewart has been elected an honorary member of the New York Neurological Society.

Medical Diary

SOCIETIES

- ROYAL SOCIETY OF MEDICINE**, 1, Wimpole-street, W.
TUESDAY, Jan. 21st.
General Meeting of Fellows. 5.30 P.M. Ballot for Election to the Fellowship.
- WEDNESDAY**.
Comparative Medicine. 5 P.M. Dr. G. Marshall Findlay and Mr. I. A. Galloway: The Routes of Infection and Paths of Transmission of Viruses.
- THURSDAY**.
Urology. 8.30 P.M. Dr. J. Leon Jona: The Kidney, Pelvis—its Normal and Pathological Physiology (cinematograph).
- FRIDAY**.
Disease in Children. 5 P.M. (Cases at 4.30 P.M.) Dr. E. P. Poulton and Mr. T. W. Adams: Metabolism, General Nutrition, and Growth in Infancy and Childhood. Dr. W. S. C. Copeman: 1 and 2, Still's Disease Cured by Gold Injections. Mr. David Levi: 3. Additional Prolapsus Big Toes. Mr. H. J. Seddon: 4. Amyloid Disease Secondary to Bone Tuberculosis. Dr. Bernard Schlesinger and Dr. Annie Flew: 5. Arachnoidactyly. Dr. E. A. Cockayne and Dr. G. H. News: 6. Specimens from a Case of Schüller-Christian Syndrome. Dr. R. Wilson (for Dr. R. Lightwood): 7. Pityriasis.
- Epidemiology and State Medicine*. 8.15 P.M. Dr. H. J. Parish, Dr. C. O. Stallybrass, Dr. J. D. Rolleston, and Surgeon-Capt. S. F. Dudley: Use and Abuse of the Swab in Combating Diphtheria.
- Physiological Medicine*. 8.30 P.M. Dr. Douglas A. Robertson: The Cathode Ray Oscillograph Applied to Bio-electric Problems.
- EUGENICS SOCIETY**.
TUESDAY, Jan. 21st.—5.15 P.M. (the Rooms of the Linnean Society, Burlington House, Piccadilly, W.), Dr. S. Zuckerman: The Physiology of Fertility in Man and Monkey.
- MEDICO-LEGAL SOCIETY**.
THURSDAY, Jan. 23rd.—8.30 P.M. (Mansion House, 26, Portland-place, W.), Mr. J. B. Montagu: The Development in Criminal Law and Penology since 1910.
- CHELSEA CLINICAL SOCIETY**.
TUESDAY, Jan. 21st.—8.30 P.M. (Hotel Rembrandt, Thurlow-place, S.W.), Sir Harold Gillies: Plastic Surgery.
- HUNTERIAN SOCIETY**.
MONDAY, Jan. 20th.—9 P.M. (Mansion House, E.C.), Dr. Sven Ingvar: The Physical Basis of Psychoneurosis (Hunterian lecture.)
- ASSOCIATION OF INDUSTRIAL MEDICAL OFFICERS**.
FRIDAY, Jan. 24th.—5.15 P.M. (London School of Hygiene and Tropical Medicine, Keppel-street, W.C.), Air Vice-Marshal Sir David Munro: Physical Standards in Industry.
- SATURDAY**—10 A.M., Dr. T. O. Garland: The Relation between the Industrial Medical Officer and the General Practitioner.
- BRITISH PSYCHOLOGICAL SOCIETY**.
WEDNESDAY, Jan. 22nd.—8.30 P.M. (11, Chandos-street, W.), Dr. Sylvia Payne: Post-war Social Activities and Advances in Psychotherapy. (Medical Section.)
- LECTURES, ADDRESSES, DEMONSTRATIONS, &c.**
- ROYAL COLLEGE OF SURGEONS OF ENGLAND**, Lincoln's Inn-fields, W.C.
MONDAY, Jan. 20th.—5 P.M., Dr. E. W. Twining: A Radiological Study of the Third Ventricle.
- WEDNESDAY**—5 P.M., Mr. Arthur Bullcud: The Assessment of Dental Sepsis as a Factor Affecting Medical and Surgical Procedures.
- FRIDAY**—5 P.M., Mr. John Gilmour: Adolescent Deformities of the Acetabulum.
- UNIVERSITY OF LONDON**.
MONDAY, Jan. 20th.—5 P.M. (University College, Gower-street, W.C.), Mr. H. R. Ing, Ph.D.: Chemical Structure and Pharmacological Action. (First of six lectures.)
- TUESDAY**—5 P.M., Mr. G. P. Wells: Comparative Physiology. (First of ten lectures.)
- WEDNESDAY**—3 P.M. (London School of Hygiene and Tropical Medicine, Keppel-street, W.C.), Dr. W. G. Savage: Bovine Tuberculosis.
- WEST LONDON HOSPITAL POST-GRADUATE COLLEGE**, Hammersmith, W.
MONDAY, Jan. 20th.—10 A.M., skin clinic, medical wards. 11 A.M., surgical wards. 2 P.M., surgical and gynecological wards, gynecological and eye clinics.
- TUESDAY**—10 A.M., medical wards. 11 A.M., surgical wards. 2 P.M., throat clinic. 4.15 P.M., Dr. Scott Pinchin: The Development and Diagnosis of Pulmonary Tuberculosis.
- WEDNESDAY**—10 A.M., children's wards and clinic, medical wards. 2 P.M., eye clinic. 4.15 P.M., Mr. J. K. Hasler: Anaesthesia.
- THURSDAY**—10 A.M., neurological and gynecological clinics. Noon, fracture clinic. 2 P.M., eye and genitourinary clinics. 4 P.M., venereal diseases.
- FRIDAY**—10 A.M., skin clinic. Noon, lecture on treatment. 2 P.M., throat clinic.
- SATURDAY**—10 A.M., children's and surgical clinics, medical wards.
- The lectures at 4.15 P.M. are open to all medical practitioners without fee.
 Operations, medical and surgical clinics daily at 2 P.M.

- NATIONAL COUNCIL FOR MENTAL HYGIENE**.
THURSDAY, Jan. 23rd, to **SATURDAY**.—Fourth Biennial Conference on Mental Health at the Central Hall, Westminster, S.W.
- HOSPITAL FOR SICK CHILDREN**, Great Ormond-street, W.C.
WEDNESDAY, Jan. 22nd.—2 P.M., Dr. E. A. Cockayne: Pneumonia. 3 P.M., Dr. D. N. Nabarro: The Bacteriology of Acute Pulmonary Disinfectants.
 Out-patient Clinics daily at 10 A.M. and ward visits (except on Wednesday) at 2 P.M.
- LONDON SCHOOL OF DERMATOLOGY**, 5, Lisle-street, W.C.
TUESDAY, Jan. 21st.—5 P.M., Dr. R. T. Brain: Erythematous squamous Eruptions.
- THURSDAY**—5 P.M., Dr. L. Forman: Sycois.
- HOSPITAL FOR EPILEPSY AND PARALYSIS**, Maida Vale, W.
THURSDAY, Jan. 23rd.—3 P.M., Dr. Golla: Demonstration.
- ST. JOHN CLINIC**, Ranelagh-road, S.W.
FRIDAY, Jan. 24th.—4.30 P.M., Mr. A. G. Timbrell-Fisher: Manipulative Methods in Physical Medicine.
- FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION**, 1, Wimpole-street, W.
MONDAY, Jan. 20th, to **SATURDAY**, Jan. 25th.—**ST. JOHN'S HOSPITAL**, 5, Lisle-street, W.C. Afternoon course in dermatology (open to non-members).—**NATIONAL HOSPITAL FOR DISEASES OF THE HEART**, Westminster-street, W. All-day course in cardiology (open to non-members).—**ST. PETER'S HOSPITAL**, Henrietta-street, W.C. All-day course in urology.—**NATIONAL TEMPERANCE HOSPITAL**, Hampstead-road, N.W. Tues., 8.30 P.M. Mr. C. A. Joll: Thyroid. Thurs., 8.30 P.M., Mr. R. C. Brock: Injuries to Bones.
 Courses arranged by the Fellowship are open only to members.
- LEEDS GENERAL INFIRMARY**.
TUESDAY, Jan. 21st.—3.30 P.M., Mr. Black: Ocular Complications of Some General Conditions.
- LEEDS PUBLIC DISPENSARY AND HOSPITAL**.
WEDNESDAY, Jan. 22nd.—4 P.M., Dr. H. H. Moll: Chronic Bronchitis.
- UNIVERSITY OF DURHAM**.
SUNDAY, Jan. 26th.—10.30 A.M. (Newcastle General Hospital), Mr. T. Clay: Surgical Cases of Interest.
- GLASGOW POST-GRADUATE ASSOCIATION**.
WEDNESDAY, Jan. 22nd.—4.15 P.M. (Royal Infirmary), Dr. John Henderson: Hypertension and Nephritis.

Appointments

- BLACK, J. I. MUNRO**, M.B. Durh., F.R.C.S. Eng., has been appointed Assistant Radium Officer to the Newcastle-upon-Tyne National Radium Centre.
- BLAIRLEY, J. B.**, M.B. Lond., F.R.C.S. Eng., M.C.O.G., Surgeon to Out-patients at the Chelsea Hospital for Women.
- BREWIS, E. G.**, M.D. Durh., M.R.C.P. Lond., D.P.H., Assistant Maternity and Child Welfare Medical Officer for Newcastle-upon-Tyne.
- BRIDGEMAN, G. J. O.**, M.B. Camb., F.R.C.S. Eng., Hon. Assistant Surgeon to the Western Ophthalmic Hospital, London.
- COLEMAN, S. M.**, M.R.C.S. Eng., D.P.M., Deputy Medical Superintendent of Renwell Hospital, Essex.
- EVANS, GEOFFREY**, M.D. Camb., F.R.C.P. Lond., Physician to St. Bartholomew's Hospital, London.
- KEON-COHEN, B. T.**, M.B. Melb., F.R.C.S. Eng., Resident Surgical Officer at the Robert Jones and Agnes Hunt Orthopaedic Hospital, Oswestry.
- LUKE, J. C.**, M.D. Montreal, F.R.C.S. Eng., Resident Surgical Officer at the Huddersfield Royal Infirmary.
- OLIVER, L. C.**, F.R.C.S. Eng., Resident Surgical Officer and Registrar to the Bristol General Hospital.
- ROBERTS, G. J.**, M.D. Edin., D.P.H., Deputy County Medical Officer of Health and Deputy School Medical Officer for the county of Denbigh.
- SHANKS, HELENA**, M.B. Glasg., D.P.H., Assistant Medical Officer of Health (Maternity and Child Welfare) for Walsall.
- TATHAM, R. C.**, F.R.C.S. Eng., Resident Surgical Officer at the Hull Royal Infirmary.
- WILLIAMS, BRYAN**, M.D., F.R.C.S. Edin., M.C.O.G., Senior Resident Assistant Medical Officer (Obstetrical and Gynecological) at the Walton Hospital, Liverpool.
- WITHERS, A.**, M.R.C.S. Eng., D.P.H., D.M.R.E., Chief Assistant to the X Ray Diagnostic Department, St. Bartholomew's Hospital, London.
- New Queen Victoria Cottage Hospital, East Grinstead.*—The following appointments are announced:—
ROWNTREE, CECIL, M.B. Lond., F.R.C.S. Eng., Surgeon
SCOTT-BROWN, W. G., M.D. Edin., F.R.C.S. Eng., Surgeon to the Ear, Nose, and Throat Department;
GARDINER-HILL, H., M.D. Camb., F.R.C.P. Lond., Physician; and
FRANKLIN, JOHN, M.D. Camb., M.R.C.P. Lond., Dermatologist.
- Certifying Surgeons under the Factory and Workshop Acts:**
 Dr. W. A. LOCHHEAD (Bingley District, York, West Riding);
 Dr. K. M. MCCracken (Kelso District, Roxburgh);
 Dr. A. M. McMASTER (Rochdale District, Lancashire);
 Dr. S. L. SMITH (St. Annes-on-the-Sea District, Lancashire);
 and Dr. S. WILSON (Rochford District, Essex);
 Dr. ISOBEL C. ARMSTRONG (Kirkintilloch, Dumbarton);
 Dr. R. D. BRIDGER (Biggleswade, Bedford).
- Medical Referee under the Workmen's Compensation Act, 1925:**
 Dr. R. W. WILCOCKS, for the Braintree, Brentwood, Chelmsford, Colchester, Clacton and Halstead, Harwich and Maldon County Court Districts (Circuit No. 33).

NOTES, COMMENTS, AND ABSTRACTS

THE PRESENT POSITION OF
MEDICAL PSYCHOLOGY *

BY R. MACDONALD LADELL, M.B. Vict.

LATE MEDICAL OFFICER, MINISTRY OF PENSIONS NEUROLOGICAL
CLINIC, BIRMINGHAM, AND NEUROLOGIST,
HOLLYMOOR HOSPITAL

THIRTY years ago when I first read a paper on the problem of hysteria and its treatment by hypnotic suggestion, I had the feeling that it was scarcely respectable to spend time on imaginary ailments, or in such an apparently unscientific method of treatment. When Freud brought forward his theory of a dynamic unconscious and showed that the symptoms of a neurosis were the expression of a compromise between two conflicting mental trends and that they therefore had a meaning to the patient, I felt myself to be on more solid scientific ground. I still, however, had the feeling of being on the wrong side of the fence, since the acceptance of Freud's theories involved a consideration of the sex instinct both in the child and in the adult. One had to overcome one's own resistances before one could manage to look upon sex in a perfectly objective way, and those who did not succeed in this were apt to think of one as nasty-minded.

Since then the Great War, in providing an outlet for primitive hate and aggression, inevitably broke down our taboos, and sex expression both in word and deed broke through all artificial restraints, and it has been found impossible to replace Jack in his Box. Sex is universally recognised as one of the great driving forces of human nature, and one which can legitimately be studied. Then, too, the problem of the war neuroses brought medical psychology from its mystic cave into the full glare of publicity. Psychology became an important part of our national defences and could no longer be ignored. It was upsetting to those who conceived of illness as necessarily due to some organic lesion, to find that men could be blind, deaf, dumb, or paralysed, through purely mental processes; but the fact that they could be cured by purely mental processes proved that this was so. Materialistic medicine which tended to regard illness as something which could be studied in terms of somatic changes only, has never recovered from the shock. It is now realised that whatever the nature of the illness, one is not dealing with disease of the mind or the body, but that mind and body always interact, so that the mentality of the patient affects the course and symptoms of disease.

Interaction of Mind and Body

The discovery of X rays, radium, and light therapy has accustomed men's minds to the idea that matter, both organic and inorganic, can be altered by powerful agents which are normally unsuspected by our five senses. Indeed, under the analysis of the physicist, matter itself is seen to be nothing but a balance of electric forces and the distinction between organic and inorganic is being broken down. One is therefore no longer afraid of being regarded as a superstitious quack when one suggests that the mind plays a part in all disease and even that the mind may initiate disease. To do so is not to deny the germ theory of disease, but merely to draw attention from the

seed to the soil. The study of the endocrine glands has revealed to us the profound influence these have on the chemistry and metabolism of the body, and we know, moreover, that the lever they respond to is the emotional situation.

We are therefore well on the way to understanding how worry and anxiety, which mean chronic fear, may break down the natural defences of the body and provide a suitable breeding-ground for hostile micro-organisms, or possibly change the nature of the micro-organism itself from benign to hostile. What is true of overt fear and anxiety is just as true of emotional states which have been repressed into the unconscious and since such repressions mostly take place in infancy and childhood, it follows that the happy child is likely to be a healthy child and vice versa. One need not evoke the œdipus complex in order to explain the delicate child. Usually he is the product of fussy parents whose anxiety as to health is reflected in a constant series of prohibitions which not only rob the youngster of its natural spontaneity and joy of life, but fill its mind with fear which finds danger all around. We can see the adult product in the health enthusiast who is always seeking health but never finding it. He believes he is cultivating health, but it is illness which dominates his mind. Health, as a natural state of things, is unknown to him; he believes it can only be found by taking thought and running after strange doctrines. His anxiety betrays him and he falls a ready victim to illness under circumstances which would leave his care-free neighbour immune.

Responsibility of the Family Doctor

This conception of health throws the responsibility of the medical profession further and further back. The family doctor must see himself as the real medical officer of health and not simply a healer. Prevention from the beginning should be his aim, and so I contend that his training should be directed to that end, and that his status in the profession should be in the topmost notch. Early in his career the student should undergo vocational tests to find out if he has the natural abilities for such an onerous and distinguished responsibility as general practice. If not, he should be allowed to concentrate on one of the numerous specialties which are more of the nature of pure science, whilst the embryo general practitioner should be relieved of much of the exact knowledge of technique in examination and treatment which now crowd his curriculum, leaving the field clear for a study of child psychology and sociology without which he will find himself ill-equipped. To advocate that specialists should be trained from the beginning ad-hoc is not to deny my thesis that in illness it is the whole individual who must be considered and not a part. A woman's aphonia may be due to some conflict in her sex or domestic life, but if the G.P. discovers it to be due to a growth on the vocal cords the actual job of removing it is not his business. Similarly there are many other procedures in radiology, electrotherapeutics, chemistry of the blood and secretions, which it is enough for him to know of, without himself being able to carry out.

Naturally I do not propose to abolish the specialist medical psychologist, but his work would be halved and the remainder made easier if the family doctor had the knowledge required and used his authority to procure the right environmental influences for the child from the start. There are mothers who

*A paper read at the Midland Medical Society on Dec. 18th, 1935.

should never be allowed to suckle their children, since their nervous handling provokes fear at the outset. There are the fussy parents who implant dread of illness. The ultra-scientific parents whose science swallows up their common sense and makes life appear a dangerous burden; the authoritative whose "do not do this" render the child afraid of any natural form of activity; the possessive mother who sees in the child something to minister to her own ego and never lets it grow away from her. The general practitioner should be able to detect and deal with all these obvious causes of maladjustment, and he should certainly take as his province the field of sexology so as to be able to give advice to those who are married, those who intend to marry, and those who want to get married but cannot. The doctor should be consulted, too, on the selection of suitable schools and should be able to give his views for or against co-education in any given case.

Problems for the Specialist

Although by these means it would be possible to cut down the supply of ill-adjusted individuals from the source, many would still slip through the net and, at one stage or another, provide a problem for the specialist. Every practitioner should be something of a psychologist, but few have the knowledge or leisure to deal with a patient on psycho-analytic lines. Psycho-analysis is essentially a technique for overcoming mental resistances so that tendencies and conflicts which have become unconscious but which still exert an influence are made conscious. Actually the term psycho-analyst should be restricted to those who agree to adhere strictly to the methods of technique and interpretation initiated by Freud. Their numbers are very few in this country. The majority of practising psychologists whilst realising that Freud's doctrine of a dynamic unconscious with its corollary of repressions and resistances must remain the fundamental conception in dealing with neurotics, have nevertheless allowed themselves some modification of technique and interpretation based on their experiences in practice. Some of them find Jung's somewhat mystical outlook of real value. Others are content with the somewhat rough-and-ready "will to power" psychology of Adler. Some borrow freely from all schools and try to preserve an open mind. An adequate adjustment of the personality can be secured at different levels and by varying methods; but I think if one feels the need of a really scientific basis for psychological theory and practice one finds it in Freud, though, personally, I find the actual Freudian technique too restricted. Freud himself, however, does not claim to have revealed the whole truth and nothing but the truth, and many workers, both at home and abroad, are adding to and altering his structure.

The late Ian Suttie's book, published after his death, on the "Origins of Love and Hate," is an example of this kind of criticism and shows the change which has come over psycho-analytic thought. He believes that Freud's work is dominated too much by the idea of the influence of the father, owing to Freud's own unconscious trends, and that in attributing so much to the oedipus situation he has ignored the earlier need of the child to make adjustments to its mother. Since this earlier adjustment is one of reciprocity, the child needs its mother, the mother needs the child, we have here the germs of social relationship. Suttie shifts the emphasis from sensory gratification as the prime need of life to the need of feeling wanted and evoking tenderness.

In other words, he finds that there is a natural urge to social relations before the natural urge to purely sensory pleasure. It is interesting to find that Suttie's theory receives confirmation from another angle. Gerald Heard, in a recent book "The Source of Civilization," reviews the history of the evolution of men in the light of recent research, and concludes that the ancestors of man survived and evolved, not, as we used to be taught, owing to their superior aggressiveness, but to their refusal to specialise in defence and by retaining to a high degree sensitiveness and awareness. These latter qualities are what make for understanding our fellows, they imply an innate sense of at-one-ment with others; and so Heard, like Suttie, finds a social instinct at the bottom of man's activities. This changed emphasis which is beginning to show in analytic psychology does not mean, of course, that the sex life either of the child or adult is unimportant, but it regards maladjustment in this sphere as evidence of a deeper maladjustment to social life. One illustration may perhaps make my meaning clear. A man whose wife is frigid may become neurotic from that cause, but his neurosis is not due to the lack of sensual gratification which he might get from a more temperamental partner, but to the sense of guilt engendered by the fact that his need to feel at one with her is frustrated. There is more in sexual intercourse than the satisfaction of an appetite and the use of that phrase rather than coitus indicates where the difference lies.

Adjustments to Life

The psychologist then has to deal with the neurotic, and the neurotic person is one who has failed to make adequate adjustments to life in one or more of three spheres as Adler has pointed out. The three spheres are those of economics, sex, and society. Economic adjustment does not, of course, mean that a man must strive to accumulate riches but that he must in some way assume responsibility for his food and shelter. Nor does his adjustment to sex imply that he must necessarily indulge in heterosexual practices. He is at liberty to remain virgin but he must be fully aware of his natural sex needs and not attempt to repress them by substituting childish fantasy. Adjustment to society means that he must respect himself as a worth-while individual and be willing to coöperate with others.

The symptoms of a neurotic can usually be interpreted as an attempt to achieve by fantasy and on a childish level what he is unable to gain in reality. One might sum him up by saying that his attitude to life is either that of "let's pretend" or "shan't play." The main difference between the neurotic and the psychotic is that the former is aware throughout of some personality defect and wishes to be like others. The psychotic, on the other hand, has entered so thoroughly into the realm of "make believe" that he has lost touch with reality. That some psychoses have an origin in organic disease of the brain as in syphilitic lesions or are due to toxæmia from acute or chronic sepsis is, of course, undeniable, but in many cases there is a borderline where the neurotic imperceptibly merges into the psychotic. Schizophrenia or dementia præcox I believe to be a case in point. There is a progressive withdrawal of interest from people and from things which leads as we all know to absolute dementia. Yet there is an early stage of emotional unbalance where contact with reality is still complete and the patient is able to justify himself. We have been too apt in the past to think of the disease

in terms of its final results and consequently to believe that once the diagnosis is made there is nothing to be done but to tuck the patient away out of sight to await the appointed end. This attitude I believe to be too pessimistic. Early cases with which I have been associated have proved to have underlying mental conflicts similar to the neurotic, and I believe equally amenable to psychotherapy.

Unfortunately the early schizophrenic is impatient with all discipline and convention, and so creates disturbances which make it impossible to keep him in his home or to board him out with ordinary people. Sooner or later his conduct is considered so scandalous that he is hastily interned and, once he feels his freedom curtailed, he appears to give up the struggle and withdraw within himself more and more; thus following what has been believed to be his destiny. To me there is nothing more pathetic than to come across these border cases. They seem as if they were swept on by a rushing current, but seeking all the time for something to cling to which might save them. One gets a grip and the boy's relief and gratitude is obvious; then comes a relapse which possibly, in an appropriate environment, could be dealt with—and the current sweeps him on to be lost in the whirlpool. I ask myself whether it is not possible to provide the environment for these often brilliant youngsters which would enable the psychologist to keep in close touch with them whilst allowing them freedom for self-expression. The kind of thing I have in mind would be an open-air colony—a sort of perpetual camp where each could have his own hut and yet the opportunity to share in a communal life with the minimum of discipline and routine. With such an environment I believe the psychologist's work need not be in vain, and that many of these troubled souls could be won back to peace and usefulness.

Prevalence of Neurotic Illness

From what I have said of the need for the individual to make his adaptations to life it is easy to understand the prevalence of neurotic illness. Society grows increasingly complex. There is nothing left of the easy going *laissez-faire* of Victorian days. Science continually springs new marvels on us, man's power of control over natural forces grows day by day—yet there seems no meaning or purpose in anything. God seems no longer in his Heaven and all right with the world as Browning was able to believe. Everywhere there is questioning and seeking. In such a world it is very hard to retain the sense of security which should be the foundation on which to build life. Economic and social adjustments are equally difficult in this age of machinery and specialisation. The individual either feels himself to be a mere cog in the vast machine—or, worse still, he finds himself unwanted and on the scrap heap before he has settled down to his task. Sexual difficulties are increased by the fact that economic pressure tends to make marriage impossible in early youth—and nowhere is there an adequate outlet for the tremendous creative urge without which man would be no better than a brute.

Society is waking up to the fact that it is manufacturing misfits and a real attempt is being made to deal with the situation. Nursery schools and child guidance clinics are doing splendid work in providing the infant with the right environment and in readjustment. Psychology has found its way into the classroom and schools are being run on sounder lines. The juvenile criminal, too, is being given his chance

and his need for treatment and not punishment is recognised. All these are hopeful signs that society does recognise its responsibilities—but the need for such institutions is still far greater than the supply. It is splendid that so much is being done, and by providing for the children society is starting at the right end. The picture is not so good when we look to see what is being done for the adult neurotic who cannot possibly afford to pay for his treatment. I doubt whether there is even in the psychological clinic established in connexion with the Birmingham hospitals sufficient staff to permit of enough time being devoted to each case to bring about the necessary rapport between physician and patient. As far as I know the Tavistock Clinic in London is the only one which provides adequate facilities for psychotherapy on analytic lines and at the same time gives training to medical men in psychological methods. The need for the extension of such clinics is obvious. Neurotic illness accounts for a very large proportion of disability under the Health Insurance Act, but both facilities for treatment and trained psychologists are lacking. Both must be provided in the near future.

Psychology deals with human nature, but it is human nature trying to adapt itself to a certain social environment. It may be we are making the task too difficult. Looking around the world as it is to-day, we seem to be in a nursery of quarrelsome children. Can we wonder at the psychotic who takes one look at us and then retires into a world of his own rather than choosing to play a part in this? I believe that coöperation is a more integral part of human nature than aggression, which is the quality our civilisation has developed most. I believe that in the future the psychologist will be asked to take a leading part in planning a social order in which coöperation will be the keynote. Only then, I believe, will the problem of the neurotic be solved.

INCOME-TAX IN GENERAL PRACTICE

THE Paddington Medical Society were addressed by Mr. G. G. Turner on Jan. 14th on the subject of income-tax in general practice. He said that the taxation of a doctor's income differs from that of any other citizen only in the peculiar but confusing fact that practice is conducted from a private residence. The chief difficulty is to decide the proportion of personal to business expenditure, though here also it is only a matter of correctly applying the broad principles of the law. In dealing with income as opposed to expenditure the position is clearer. All profits, including the fees received from societies, panel, and public appointments, are assessed under the ordinary Schedule D "trades and professions," with which the practitioner is mainly concerned. If, however, he receives a salary for a whole-time work, he is taxed under the Schedule E relating to salaries. The doctor is entitled to select the closing date of his annual accounts, but he is taxed for his financial year ending before April 5th. If the basis of his assessment is the "cash system" the assessment is made only on the income received and expenses paid during the year, excluding all unpaid debts or credits. The better method, Mr. Turner insisted, is the "earnings system" in which all amounts earned and expenses incurred during the year are assessed whether there was actual payment or not; an adjustment is made for unpaid bills in the following year. A record of accounts is not compulsory, but it is strongly recommended that one should be kept to control the assessment, for all expenses due to the practice itself are exempt from taxation. Some doctors do not realise that among the deductions allowed from the gross profit are subscriptions to recognised societies and charities,

the fees, cost, and board of a locum tenens or assistant for sickness or holiday relief, the salaries of servants employed solely for the practice; the maintenance of equipment and repairs, decorations, and literature for the waiting-room and surgery; and the cost of professional literature. Insurance premiums can be deducted only if sick benefits are declared as income.

Expenses due both to practice and to private life are assessed in the proportions in which they apply to each; for example, the rent of the house, allowance being made if the practice is in an expensive locality or if the best room in the house has to be used for a surgery. Repairs, decorations, and depreciation have to be apportioned, also running expenses, cost of renewal and wear and tear of cars and electrical apparatus, and the wages of servants. In conclusion, Mr. Turner emphasised the desirability in the practitioner's own interest, of keeping detailed accounts and of consulting an expert accountant.

UNDESIRABLE, BUT WANTED

IF any of our readers receive a call from a man who gives his name as Captain MacDonald or Captain MacDoull, and who answers to the police description which follows, the visitor should be detained under some pretext until the police, who desire to hear about him, can be communicated with. The description furnished to us of "the captain" is detailed. He appears to be a little over 60 and stands 5 ft. 8 in. He is white-haired, baldish, and has a white waxed military moustache. He is of military bearing, has a ruddy complexion, officially described as "bloated," and when last seen was wearing a dark overcoat, a bowler hat, a bow tie, and spats. He speaks plausibly and may allude to having been at an old public school. He has obtained money from medical practitioners by claiming acquaintance with them or with a common friend, naming the friend, such conversations having led to loans. A coup of this sort he brought off in Harley-street on Dec. 17th last, in a distinctly ingenious way. "Captain MacDonald" is now wanted by the C.I. Departments of Marylebone-lane (Welbeck 2824) and Bow-street (Temple Bar 6400) police stations.

GUIDE TO LECTURES

Messrs. H. K. Lewis and Co., Ltd., are issuing with the bi-monthly list of books added to their lending library a list of lectures on medical, scientific, and technical subjects to be given in London during the same period. They believe, and we think rightly, that such a list may be of use to their subscribers. The lectures enumerated are given in the schools of London University and other places which are open to interested persons, and the list illustrates the wide range of first-hand information available to the inquiring mind. Suggestions for making the list more complete may be addressed to the compiler, Guide to Lectures, c/o Messrs. H. K. Lewis and Co., Ltd., 136, Gower-street, London, W.C.1.

Vacancies

For further information refer to the advertisement columns

Aberdeen City District Mental Hospital.—Jun. Asst. M.O. £300.
Aldrich-Blake Memorial Trust, 3, Hunter-street, W.C.—Scholarship. 200 guineas.
Ayr Royal Burgh.—M.O.H. £800.
Barry Surgical Hospital.—Res. Surg. O. £350.
Bedford County Hospital.—Second H.S. At rate of £150.
Birmingham and Midland Eye Hospital.—Res. Surg. O. £200.
Birmingham, Romsley Hill Sanatorium.—Res. Asst. M.O. £240.
Birmingham, Selly Oak Hospital.—Jun. M.O.'s. Each at rate of £200.
Blackburn, Brockhall Institution for Mental Defectives, Langho.—Jun. Asst. M.O. £500.
Bootle General Hospital.—H.P., two H.S.'s. Also Cas. O. Each at rate of £150.
Bristol Royal Infirmary.—H.P.'s, H.S.'s, &c. Each at rate of £80. Also Sen. Obstet. Surg. At rate of £100.
Carshalton, Surrey, Queen Mary's Hospital for Children.—Asst. M.O. £250.
Charing Cross Hospital, W.C.—Hon. Anesthetist.
Chelsea Hospital for Women, Arthur-street, S.W.—Pathologist. £40.
Chester Royal Infirmary.—H.P. and H.S. Each £150.
City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.
Colindale Hospital, Colindale, N.W.—Asst. M.O. £350.
County Hall, Westminster Bridge, S.E.—Asst. M.O. £600.

Coventry and Warwickshire Hospital.—H.S. At rate of £125.
Croydon Mental Hospital, Upper Warlingham.—Asst. M.O. £350.
Dorset County Council.—Asst. County M.O. £500. Education Committee: Asst. Dental Officer. £450.
Eastern Fever Hospital, Homerton-grove, E.—Asst. M.O. £250.
East Ham Memorial Hospital, Shrewsbury-road, E.—H.P. At rate of £150.
Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Asst. Radiologist. £100.
Evelina Hospital for Sick Children, Southwark, S.E.—Dental Surgeon. 50 guineas.
Glasgow University.—Harry Stewart Hutchison Prize. £50.
Gloucestershire Royal Infirmary, &c.—H.S. At rate of £150.
Grimshy and District Hospital.—Sen. H.S. £200. Also Jun. H.S. and H.P. Each £150.
Grocers' Company, Grocers' Hall, E.C.—Scholarships. Each £300.
Hampstead General and N.W. London Hospital, Haaverstock Hill, N.W.—H.P. At rate of £100.
Hereford County Hospital.—Sen. H.S. £200. Also H.P. At rate of £150.
Leicester City General Hospital.—Two Res. M.O.'s. Each £300.
Liverpool and District Hospital for Diseases of Heart.—H.P. At rate of £100.
Liverpool Sanatorium, Delamere Forest, Frodsham.—Med. Sup't. £200.
L.C.C. Group Laboratory, Archway Hospital, Archway-road, N.—Asst. Pathologist. £650.
London County Council.—Asst. M.O.'s for Mental Hospital. Each £170.
London Hospital, E.—Hon. Asst. Surgeon.
London School of Clinical Medicine, Dreadnought Hospital, Greenwich, S.E.—Jun. Pathologist. £100.
Maidstone, Kent County Ophthalmic and Aural Hospital.—H.S. to Ear, Nose, and Throat Dept. At rate of £200.
Manchester, Ancoats Hospital.—Two H.S.'s. Each at rate of £100. Also Med. Reg. £50.
Manchester Ear Hospital, Grosvenor-square, All Saints.—H.S. At rate of £150.
Manchester Royal Infirmary.—H.S. to Orthopaedic Dept. At rate of £50.
Middlesbrough County Borough.—Deputy M.O.H. £450.
Middlesex County Council.—Asst. M.O. £600.
Newcastle-upon-Tyne, Hospital for Sick Children.—Res. Surg. O. £250.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Jun. Surg. Reg. £150.
Oldham, Boundary Park Municipal Hospital.—Res. Asst. M.O. At rate of £200.
Oswestry, Robert Jones and Agnes Hunt Orthopaedic Hospital.—H.S. At rate of £200.
Paddington Metropolitan Borough.—Visiting M.O. 1½ guineas per attendance.
Papworth Village Settlement, Surgical Unit.—H.S. £200.
Pinewood Sanatorium, Wokingham, Berks.—Asst. M.O. £250.
Plymouth City.—Deputy M.O.H. £750.
Plymouth, Mount Gold Orthopaedic and Tuberculosis Hospital.—Asst. Res. M.O. £350.
Portsmouth Royal Hospital.—H.S. At rate of £130.
Preston, Biddulph Grange Orthopaedic Hospital.—Sen. H.S. At rate of £250.
Princess Louise Kensington Hospital for Children, St. Quintin-arcene, W.—H.P. At rate of £100.
Royal Eye Hospital, St. George's-circus, Southwark, S.E.—Hon. Asst. Surgeon.
Royal Masonic Hospital, Ravenscourt Park, W.—Surgeon.
St. John's Hospital, Lewisham, S.E.—Res. H.P. At rate of £100.
Salisbury Royal Hospital.—Orthopaedic Reg. £100.
Salisbury General Infirmary.—H.S. At rate of £125.
Smethwick, St. Chad's Hospital.—Res. Obstet. Officer. £350.
Somerser and Bath Mental Hospital, Colford, near Taunton.—Sen. Asst. M.O. £650.
South-east-Sea General Hospital.—Cas. O. At rate of £100.
Stirling District Mental Hospital, Larbert.—Jun. Asst. M.O. £300.
Stoke-on-Trent, Stannell Sanatorium.—Res. M.O. £250.
Two Res. H.P.'s. Each £125.
Westminster Hospital, Broad Sanctuary, S.W.—Asst. Obstet. Surgeon. Also House Anesthetist. At rate of £100.
Worcester County Council.—County Analyst and Bacteriologist. £800.
Worcester Royal Infirmary.—H.S. and H.P. Each at rate of £160.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at North Walsham (Norfolk), Bangor (Caernarvon), and Ruthin (Denbigh).

Corrigendum.—In the L.C.C. advertisement for Assistant Medical Officers which appeared in our advertisement columns of Jan. 11th (p. 48) the allowance of £60 to holders of D.P.M. should have been given as £50. The advertisement, as amended, is repeated in our present issue.

ASSOCIATION OF INDUSTRIAL MEDICAL OFFICERS.—The second meeting of this association will be held in the London School of Hygiene and Tropical Medicine, Keppel-street, W.C., on Friday, Jan. 24th, at 5.15 P.M., and on Saturday at 10 A.M. Discussions will be opened on physical standards in industry by Air Vice-Marshal Sir David Munro, secretary of the Industrial Health Research Board, and on the relation between the industrial medical officer and the general practitioner by Dr. T. O. Garland, medical officer of Carreras, Limited. The hon. secretary of the association is Dr. Donald Stewart, I.C.I. Metals, Ltd., Kynoch Works, Witton, Birmingham 6.

ADDRESSES AND ORIGINAL ARTICLES

CLINICAL MEDICINE

A FAREWELL LECTURE¹

BY LORD HORDER, K.C.V.O., M.D., F.R.C.P.Lond.

In place of the customary "Gentlemen" with which these lectures are prefaced I am to-day privileged to address you as "Colleagues and gentlemen." The compliment paid to me by the presence of so many of my fellow teachers is both graceful and touching. It is also, as compliments are wont to be, expensive, since the occasion which determines it costs me a great deal. Swan songs are prone to be sententious—a quality which I always try to avoid, whether in speech or in action. Personalities I dislike just as much as I dislike sententiousness. I will allow myself one brief deviation from my practice in respect of each of these two antipathies. I admit that if, after all these years, I had no sort of message for those who follow me, I should feel heartily ashamed. I also admit that this, my last clinical lecture at Bart.'s, far from leaving my withers unwrung, strains them to their utmost.

The occasion justifies a departure from custom in regard to these lectures. To-day I am not bringing before you a "difficult case," unravelling its complications as best I can, and trying to make clear the mental process by which this may be done, and thereby invite that drowsiness which, in these circumstances, tends to steal over my audience (pardonable only in the case of my house physician, for has he not already been "bored stiff" by my previous rehearsals in the ward?). Nor am I bringing a more simple case, which may be taken as a peg upon which to hang a list of causes or symptoms of disease, and thereby stimulate those who scent the possibility of something which is of potential use in another place, a stimulus which extends at times even to a little hurried note-taking (for I have never misconstrued this brief spurt of active, rather than passive, attention on the part of the less frugal minded of my audience). Instead of doing either of these things I propose to say something about clinical medicine itself—that is, about that part of the physician's work to which these lectures are a running commentary.

"TOUJOURS LES MALADES"

Whatever may be the special branch of medicine that attracts us, it is commonly accepted that it is at the bedside where, on the one hand, the vital expressions of diseases are manifested and where, on the other, the contributions made by the laboratory, both to diagnosis and to therapy, must eventually be tested. "Les malades, toujours les malades." But medicine provides such a large field for human interest and activity that there are many points at which a man may branch off into a whole life's work of relatively detached scientific effort. Any one of these digressions may take him so far away from the patient that, quite joyfully and quite successfully, he may make valuable contributions to what becomes, in effect, pure science. He may then be tempted to consider clinical medicine but a poor affair, scarcely worth the pursuit of a trained intelligence. Whereas I regard it as a very inviting field for the most highly cultivated minds—a field in which

meagre achievement, far from indicating an essential poverty in the soil that is being tilled, signifies only that the husbandman is not always as alert and well-equipped as he might be. However, what I say this morning is not intended as an apology for the clinician so much as a brief survey of his place in medicine and how his functions are, in my judgment, best performed.

In the view of some people the clinician has not advanced, or developed, proportionately with those of his colleagues who are primarily concerned with the ancillary subjects of surgical technique, bacteriology, and biochemistry. I cannot accept this estimate, and I think it is due to a false, or a forgotten, conception of the clinician's function. Though this remains what it fundamentally always was—the collection and evaluation of all available data which are pertinent to the diagnosis and the treatment of the sick person—I believe that the growth of the means by which this function is achieved has been even greater in the case of the clinician than in the case of any one of his colleagues, for the reason that the whole of their combined knowledge is available for him if he is familiar with it and cares to use it.

THREE GREAT ADVANCES

In my own time I have witnessed three great advances in the science and art of clinical medicine, and (though "I speak as a fool") these advances have seemed to me to make the clinician of much greater potential service to the patient than he was before they took place. How much he is actually of greater service depends upon himself, and the degree to which he has absorbed these advances and transmuted them into his practical work.

The function of the old clinicians was not inaptly termed "walking the wards," an expression which has its modern counterpart in "going round." Our predecessors made large observations rather than small, and they acquired a facility in diagnosis and in prognosis which seemed to many quite uncanny. This facility was really due to the fact that they had trained themselves to make a greater number of observations than they were actually aware of. Their eyes and ears and touch and smell were unaided by instruments of precision, and the pitch of excellence to which their senses perforce—and at long last—arrived was very astonishing. But their exactness stopped short at the point where their unaided senses could pierce the mystery no farther and this in many cases was stopping too short to enable them to give the help which the patient needed. For example, septicæmia was only septicæmia, and heart disease, for the most part, was only heart disease.

THE LESSONS OF THE POST-MORTEM ROOM

Then came the first great advance. With the increased frequency of, and greater thoroughness in, post-mortem examinations, the clinician began to think morbid-anatomically. This was a notable move forward. He was able to visualise the diseased organs as they actually existed during life, and this visualisation gave his clinical methods a clearer purpose and direction. This habit of correlation of the clinical features of the case with post-mortem experience remains, and must of necessity remain, one of the most valuable aids to diagnosis and prognosis. The clinician who relaxes in a punctilious attendance at the post-mortems upon his patients, or upon patients of his colleagues, thinking the time

¹ With acknowledgments to St. Bartholomew's Hospital Journal. 5365

could be better spent in the wards or in the out-patient rooms, is not only denying himself the chief correction to his exuberance and to his vanity, he is departing from the bed-rock of medicine itself. What he says at the bedside may, or may not be, the truth; what he sees in the post-mortem room is the truth. In this connexion I should like to enter a plea against too much reservation of post-mortem material for deferred examination. Some such reservation is at times desirable and even necessary, but it should be upon the decision of the pathologist and of the clinician jointly, each having regard to the claims of the other. Be it remembered that diseased organs that are opened at the time of the post-mortem examination, and are seen in relation to the rest of the body, nearly always throw light upon the obscurity that has perhaps been in the minds of those who have seen the "case" during life. Whereas organs that are dissected by the aid of the pathologist's midnight oil may, or may not, illumine his own individual darkness.

LABORATORY METHODS

The second advance came with the development of laboratory methods, since in these the clinician found new and invaluable aids to his work. The study of the patient *qua* patient was supplemented by the study of materials derived from the patient. Thus we saw the birth of clinical pathology. The past 30 years have witnessed this lusty babe grow up to a vigorous manhood. As is wont with the virile adolescent, there have been times when he thought himself more important than he really was, when he sought to bestride the whole world of medical knowledge, when he firmly believed he *was* medicine rather than merely making his contribution to medicine. His incursion into the sick room was apt to be somewhat brusque, not to say at times truculent. Cuckoo-like, he jostled and pushed and oft-times succeeded in ousting his more timid and gentle colleague from the latter's legitimate sphere. He took to describing himself in the telephone directory as "physician," and he invited the credulous sick to consult him. The public, with its child-like confidence in machinery, loved him, welcoming his advent as signalling the millennium of exact medicine, and unaware that the human brain is the best machine of all. A catalogue of the flora of the fauces and/or of the fæces, a complete blood count, a chemical analysis of the urine to the third place of decimals: "What further may be sought for or declared?" Not only was the new gospel about to dispel the darkness that shrouded diagnosis, it was about to illumine the therapeutic field also. The "opsonic index" for an exact diagnosis, the hypodermic syringe, charged with the appropriate antigen, for effective treatment, and medicine was "taped" at last. The clinician came to be regarded by some with amused tolerance; by others, even less generously minded, as obstructive to real progress. Nosology disappeared and pathology contracted down to the name of the infecting agent; patients no longer suffered from diseases but from micro-organisms. "What is the matter with the man in bed 4?" "T.B. . . ."

But fortunately for the patient, for whom, like the soul of Faustus, the powers of good and evil were fighting, some clinicians kept their heads. They absorbed what was good in these clinico-pathological advances, seeing in them important supplemental aids to their methods rather than a substitution for them. But the older and cruder notions of infection had to be entirely revised; and

gaps in the knowledge of metabolism had to be filled. Not only was it necessary that the clinician should think morbid-anatomically, it was necessary that he should think bacteriologically and bio-chemically also.

RÖNTGENOLOGY

Then came the third great advance, and by means of an entirely new tool. I refer to the arrival of roentgenology. Though useful from the first, it has taken a good many years to improve the technique and to get the method under control, but to-day there is probably no more useful addition to the clinician's methods. The exercise of forbearance in interpretation on the diagnostic side, and of moderation in claims on the therapeutic side, have become an important part of the clinician's work.

ESSENTIAL DATA

I said just now that the fundamental function of the clinician is to collect and to evaluate data. But what data? The clinician is not a *mere* collector of data. If he were, diagnosis would be as easy for one man as for another. Nor is he a mere recorder of cases seen. If he were, the palm would go to the panel practitioner or to the junior casualty physician, though this consideration waives a fact of which we are well aware—that it is possible, nay easy, to see a great number of patients and yet not see their diseases. It is the *essential* data that we want, not the unessential. It is data that are associated, not data that are dissociated. The capacity to neglect is as important as the capacity to take notice. True, the more obscure the case the less we can afford, in the first survey, to omit any examination; but after a time there comes what may seem to some an almost astounding negligence. This is not forgetfulness, nor a lapse from good methods; *it is the ability safely to omit*. Patients' dossiers are apt, in these days, to be so full and so heterogeneous that the courage to say of some of the reports, "noted, nothing doing," is often the first step in the elucidation of the problem. It falls to the clinician alone to become familiar with the range of health, to be sensitive to what lies within it, and to what lies outside it. The exercise of this sensitiveness in any particular case becomes more and more essential the more meticulously exact the reports of the experts may be. And these reports tend to be more and more meticulously exact with the increasing tendency to specialism and the myopia which goes with it. The number of patients whose hearts are healthy is in inverse proportion to the number of cardiologists they consult, and the frequency with which they are "electrocardiographed." An upper respiratory tract which is passed as "normal" by a careful "nose and throat man" will soon be so rare as to merit demonstration at the Royal Society of Medicine.

BEDSIDE OBSERVATIONS

It has been during the recent period of intensive laboratory investigations on the clinico-pathological side of diagnosis that the notion has arisen that the clinician's observations are not really scientific, that they are of the nature of guess-work, whereas everything that happens in the laboratory is controlled by the infallible rules of logic. The test-tube and the microscope cannot lie. But God alone knows if what the physician thinks is an enlarged spleen is the spleen; or if rose spots are not "any old spots"; or the association of a soft and infrequent pulse with a continued high fever is not some odd trick of Nature designed to intrigue the curious-minded; and why

should not a week of intense headache pass away somewhat suddenly and be replaced by a muttering delirium; and an unexplained deafness appear? Funny things like these do happen to people who suffer from a disease of microbic origin. But the one certain thing is that the disease isn't typhoid fever, or any infection in the T.A.B. group, because there is no agglutination of the laboratory stains of those organisms by the patient's serum. Strange, this idea that facts have a different value according as they are observed at the bedside or in the laboratory. Stranger still, the idea that one negative observation in the laboratory should, by responsible clinicians, be regarded as more important than six positive observations at the bedside. "We can never, by a single experiment, prove the non-existence of a supposed effect." If "science arises from the discovery of identity amidst diversity" then it matters not if the identity be discovered by careful observation of the patient clinically or pathologically. The whole question is, is it a *true* identity? But this, in the last resort, depends upon the critical judgment of the observer. Granted that the exercise of judgment at the bedside is more difficult than it is in the laboratory, mistakes in judgment are not confined to the bedside. We have only to send a specimen of the same stool to two, or even to six, bacteriologists, equally expert, to find that failure to "discover identity" is by no means only a bedside difficulty. Here the question of criteria is involved, as we know, and criteria are not always uniform even amongst laboratory workers. Their results are therefore, of necessity, not always comparable. Now the clinician's criteria are, in general, less exact than the pathologist's, nor can they be made so exact very easily; but if they are made severe, as they should be—if nothing is termed positive which is only doubtfully positive; if the clinician's judgment concerning his observations is controlled by reliable technique; if discovered identities are unequivocal—then his "facts" are as scientific and as logical as are those of the pathologist. The truth is that clear thinking, with forbearance, is essential to the satisfactory solution of a diagnostic problem whether the contribution comes from the laboratory or from the bedside.

MENTAL TECHNIQUE

There is a technique of the mind as well as of the eye and of the hand, and the former is quite as essential as the latter. It is not only what you find at the bedside, it is also what you bring to the bedside. The eye sees what it takes with it the power of seeing: it is the *mind* that sees. And surely it is the same in the laboratory? In both spheres there comes to some—slowly, painfully, towards the end (alas!)—facility born by patient practice out of time. Clinician and pathologist are more akin than they sometimes realise. Each of them takes a pride (which the other regards as excessive) in his small discoveries, and each of them lacks humility (or so the other thinks) in face of the certain fact that every day, whether it be in the ward or in the laboratory, momentous things are happening under their very eyes, yet they see them not, for they are both under the same ban—they cannot live out of their generation.

CLINICAL RESEARCH

If, looking back, I can feel satisfaction with any modest effort of my own in the diagnostic field, it is in opposing the tendency of the past two decades towards the divorce of clinical from laboratory methods. In this hospital this divorce has really never occurred. Kanthack and Andrewes and Gordon

and Kettle and Canti have been too wise not to see that pathological processes have a unity which centres itself in the patient and that without careful study at the bedside only one part of these processes can be elucidated. It is the close coöperation of both observers, and this alone, that can lead to results that are helpful. We at Bart.'s have been fortunate in this matter, and I hasten to add that any mild strictures of mine refer not to our school, but to a part of the greater world of medicine outside.

But clinical medicine in this greater world is just now coming back into its own. The prince has taken notice of the neglected charms of our modest Cinderella. A marriage is being arranged. Professors are leading her to the altar, and the name of her bridegroom is Research. There is just time for me, as an interested and loving uncle, to give the pair my blessing.

"Let me not to the marriage of true minds
Admit impediments. Love is not love
Which alters when it alteration finds,
Or bends with the remover to remove:
O, no! it is an ever fixed mark
That looks on tempests and is never shaken;
It is the star to every wandering bark,
Whose worth's unknown, although his height be taken."

And so is resumed afresh the long line of clinical observers which has been lit by the genius of Hippocrates, of Sydenham, of Trousseau, of Osler, and of many others—masters in clinical research.

CLINICAL TEACHING

A few words about clinical teaching before I close. Time has not led me to change my view that the best help the clinician can give his pupils during the early part of their career is to insist that they use their words carefully, exactly, and without ambiguity. Next to this, but only by means of this, he can help them to think clearly. This is important, too, for as Thomas Hobbes said "as men abound in copiousness of language; so they become more wise, or more mad than ordinary." I may be forgiven for repeating myself and saying that the first text-book of medicine should be Jevons' "Primer of Logic." It costs one shilling but is worth untold gold. Note-taking must never be scamped. What is written about the facts of a case demands the same care as what is said about them. If to these things can be added a thorough drilling in methods of clinical examination we have really accomplished a great deal in the first three months. Be it never forgotten that to watch the teacher's own methods is of greater help in the earlier stages of clerking than to try to understand what he is talking about. Efforts to teach medicine, however tempting, should be resisted. The keen student will teach himself medicine if he is properly trained in these important preliminaries.

THE CURRICULUM

I wish something could be done to save the clerk's valuable time in the wards by introducing into the pre-clinical studies a number of examinations and methods which have really to do with anatomy and physiology. I have often dealt with this matter, but I make no excuse for referring to it again. The fundus oculi and the membrana tympani are normal anatomical structures, yet few clinical clerks have ever seen them before they enter the wards and, largely as the result of this fact, some have not seen them clearly even when they leave. We could profitably exchange the time spent over theories of colour vision and the intimate structure of the organ of Corti for these important matters. The blood-cells are a part of normal histology but they have rarely been counted, or, if they have, it has only been during the

demonstration of the Thoma-Zeiss pipette. The contours of the abdomen, the reflexes and tendon-jerks, the normal gait, the surface markings of the lungs, the deposits that may occur in urine apart from disease, the flora of the fæces in health . . . is it really economical that the time of the clinicians—and of the senior clinicians—should be taken up in teaching about these things? Mr. Dean, we have praised you, though not more than you deserve, on account of the magnificent laboratories and equipment which you have assembled on the Merchant Taylors' site. Here is another piece of work for you and your colleagues—this adjustment of the pre-clinical studies so that they conform more to the requirements of men who are going to be doctors, and valuable time may be saved for the later years of the curriculum.

VALE

Well, I must bid you good-bye. It has all been, in schoolboy phraseology, "great fun" and I have thoroughly enjoyed it. The clinician's material has not been confined to the patients in their beds. For there have been the clerks themselves . . . and the rest of the "firm" . . . and the nursing staff . . . and the porters whistling outside the ward, under the echoing shaft of the lift . . . and the buzzer that calls for the anaesthetist who is never there . . . and this lecture theatre. More than all this, there has been the world outside—the domestic circle, the market place, the forum. There has been the whole human comedy as seen by Shakespeare and Molière and Cervantes and the other great clinical observers. I hope I have not put too many of you, whom I have been privileged to teach, out of your stride. I trust my methods, and my teaching, have conformed in some measure to the great traditions of this place. But they have been largely, and of necessity, myself:

"ay, there's the rub."

So now I doff my ward coat and hand it to you, Evans, my friend. Gow and you have been loyal, inspiring, and very charitable colleagues, and I tender you my most sincere thanks. God bless you, and God help you!

EXOPHTHALMOS

FOLLOWING THE ADMINISTRATION OF THYROID EXTRACT *

By W. RUSSELL BRAIN, D.M. Oxon., F.R.C.P. Lond.

PHYSICIAN WITH CHARGE OF OUT-PATIENTS TO THE LONDON HOSPITAL; PHYSICIAN TO THE ROYAL LONDON OPHTHALMIC HOSPITAL AND THE HOSPITAL FOR EPILEPSY AND PARALYSIS, MAIDA VALE

ONE of the most puzzling of the many problems arising out of the state of thyrotoxicosis is the mode of production of exophthalmos. There is at present no satisfactory explanation either of the nature of the changes in the orbit which lead to exophthalmos, nor of the way in which these changes are associated with thyrotoxicosis. The difficulty of explaining the exophthalmos is enhanced by the fact, which is generally admitted, that the administration of thyroxine or of thyroid extract, whether experimentally to animals or therapeutically to man, does not as a rule lead to exophthalmos. The rarity of this event in man may be gauged from the fact that not more than about twenty instances have been reported. The development of progressive exoph-

thalmos in patients who have previously undergone subtotal thyroidectomy for thyrotoxicosis is a closely related phenomenon, since this may be precipitated by the administration of thyroid extract to correct post-operative hypothyroidism. The object of this paper is to report a new case of exophthalmos following the administration of thyroid extract. The significance of this sequence of events is discussed in the light of this and previously reported cases and of recent experimental work on exophthalmos.

AUTHOR'S CASE

An unmarried Hebrew woman, aged 38, was referred to me from Sir Stewart Duke-Elder's clinic at the Royal London Ophthalmic Hospital on May 14th, 1934. Since the age of 5 she had suffered from epileptic fits, which were mainly nocturnal, and occurred almost every night during her sleep, though in addition she used to have one or two every week during the day. Her menstrual history was normal.

In October, 1923, in addition to bromide and iodide she was given thyroid tablets, grs. 2, twice a day for three months. In 1926 she had a further course of thyroid extract for three months and again in 1928. In 1929 she again took thyroid extract until February, 1930. In October, 1930, she started to take $\frac{1}{2}$ grain of thyroid extract, and then 1 grain, twice daily, and had taken the thyroid almost continuously ever since. During the whole of this period she had been taking bromides almost constantly and occasionally Luminal. During the three and a half years before she came under observation she must have taken approximately 2000 grains of thyroid extract.

In the middle of April, 1934, the left eye was first noticed to be prominent. When she first attended the Royal London Ophthalmic Hospital her condition was as follows. Of somewhat retarded mental development. Rather obese. Weight 11 st. 6 lb. (Average weight 8 st. 10 lb.) Height 4 ft. 11 $\frac{1}{2}$ in. Thick, dark hair on scalp. Heavy eyebrows. Growth of hair on lips and chin, shaved. Thyroid not visibly or palpably enlarged. Pulse regular, rate varying between 90 and 104. Blood pressure 135/80. Fine tremor of hands. The left eye protruded 4 to 5 mm. in front of the right and the left upper lid was retracted. No orbital irregularity was discovered. The ocular fundi were normal and visual acuity was 6/6 in both eyes. Central nervous system, heart, lungs, and abdomen were normal. The urine contained a trace of albumin and no sugar.

The administration of thyroid extract was at once suspended. By July 23rd the patient's pulse-rate had dropped to from 80 to 84. The state of her eye at this time is shown in Figs. 1 and 2.

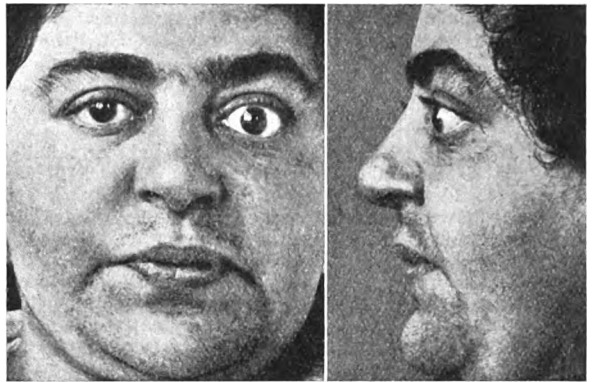
She was admitted to the London Hospital on Oct. 4th, 1934 (No. 41578). The exophthalmos had now diminished considerably (Figs. 3 and 4) and her weight was 11 st. 12 $\frac{1}{2}$ lb. Radiograms of the skull showed no abnormality. Her basal metabolic rate on Oct. 19th was plus 9.2 per cent. and on Oct. 21st plus 4 per cent. Her blood Wassermann reaction was negative. While in hospital she had six epileptic fits. She was discharged from hospital on Oct. 23rd, 1934, and has since been under observation as an out-patient. The exophthalmos steadily diminished (Figs. 5 and 6) until in April, 1935, the left eye was only 1 mm. in front of the right. The difference in November, 1935, was scarcely perceptible (Figs. 7 and 8). After the withdrawal of the thyroid extract her weight steadily increased until in May, 1935, it was 12 st. 8 lb., since when she has been on a reducing diet. Her epileptic fits have responded well to luminal and bromide, but she still has an attack occasionally.

In this patient, therefore, the unilateral exophthalmos, which followed the prolonged but intermittent administration of thyroid extract, subsided almost completely within a year of the withdrawal of thyroid. It is noteworthy that the patient showed signs of endocrine abnormality—namely, obesity and excessive hairiness.

* From the neurological department of the London Hospital, and the Royal London Ophthalmic Hospital.



FIGS. 1 and 2.—The patient on July 25th, 1934.



FIGS. 3 and 4.—Oct. 22nd, 1934.

PREVIOUSLY REPORTED CASES

Béclère's Case (1894).¹—Female, aged 34. Had been treated for myxœdema by means of thyroid gland. By mistake she took 92 grammes of thyroid gland in eleven days. After this she developed exophthalmos and a staring expression, tremor of the arms, tachycardia, instability of pulse, elevation of the temperature, insomnia, agitation, polyuria, glycosuria, albuminuria, and paraplegia. The paraplegia, in view of a history of previous hysterical symptoms, was regarded as hysterical.

von Nothhafft's Case (1894).²⁴—Male, aged 43. Suffered from increasing obesity and treated himself with thyroid. Within about five weeks he took nearly a thousand tablets of 0.3 gramme Burroughs Wellcome's thyroid preparation. During the five weeks he lost 28 lb. in weight, from 220 lb. to 192 lb. During the third week he began to develop symptoms. At the end of five weeks he showed moderate exophthalmos, with lid lag. His face was flushed and the whole skin moist. There was a gross tremor, most severe in the hands. The pulse-rate was 120. The thyroid was not visibly or palpably enlarged.

Lawford's Case (1900).¹⁰—Female, aged 34. Had suffered from myxœdema for five years. Thyroid extract administered, dose not stated. As she benefited greatly, the treatment was interrupted but was resumed 4½ years later. After one week the eyes became prominent and the exophthalmos steadily increased. She did not complain of palpitation and was not emotional. The thyroid gland was scarcely felt, so was not enlarged.

Ulrich's Case (1900).²⁵—Female, aged 46. Had suffered from myxœdema for ten years. On thyroid treatment (0.05 x 2) there was rapid improvement and her hair grew again, but she developed exophthalmos, tachycardia, excessive sweating, and progressive wasting, resembling a patient with Basedow's disease.

Stegmann's Case (1906).²⁴—Female, aged 14. Had suffered from her fourth year from slight swelling of the neck, which gradually increased in size. She was given

1½ Thyroidin tablets per day. She rapidly developed severe palpitations and the treatment was discontinued. There was, however, only temporary improvement and three months after taking the thyroid she began to suffer from palpitations and, a month later, protrusion of the eyes began to develop. Eight months after the beginning of the treatment her weight had fallen from 64 to 46.7 kg. She exhibited gross exophthalmos and a diffuse, soft, visibly pulsating enlargement of the thyroid, very severe tremor, and a pulse which was very irregular and lay between 130 and 150 in rate. The heart was slightly enlarged. Her general condition improved greatly following X ray irradiation of the thyroid.

Pulawski's Case (1912).²¹—Female, aged 47. Had had a goitre for 18 years. As it began to increase in size she was ordered to take thyroidin. During four weeks she took 38 tablets (Poehl). She began to lose weight and suffered from palpitations. Four months after beginning to take the thyroid she had slight exophthalmos and Stellwag's sign was positive. She was emaciated and nervous and tremulous, with a pulse-rate of 120. The goitre was firm but did not pulsate. The patient refused operation but improved slightly on medical treatment.

Holböll's Case (1927).⁵—Female, aged 46. Increased steadily in weight after the menopause. For 50 days she took thyroid gland tablets (Medix, strength No. 4, 1 tablet a day). She began to suffer from nervousness, tremor, and palpitation and, later, exophthalmos, sweating, and enlargement of the thyroid developed. The loss of weight was progressive. Four months after beginning to take the thyroid extract the typical picture of exophthalmic goitre was present. The pulse-rate ranged between 100 and 140. The basal metabolic rate was 157 per cent. She became delirious and died one month later. There was no autopsy.

H. U. Møller's Case (1928).¹⁶—Female, aged 49. Had been taking thyroid preparation for seven years. She developed unilateral exophthalmos, for which no local



FIGS. 5 and 6.—Dec. 31st, 1934.



FIGS. 7 and 8.—Nov. 28th, 1935.

cause could be found on ophthalmological and X ray examination. She also showed tachycardia, tremor, goitre, glycosuria, fasting hyperglycæmia (0.137 per cent.). The thyroid administration was discontinued. Six months later the goitre and exophthalmos persisted but the pulse-rate was normal. The diabetes proved to be of a very benign character.

*E. Møller's Case 1 (1930).*¹⁵—Female, aged 49. Artificial menopause induced four years previously with X rays, owing to uterine fibroids. After this there was some increase in weight and she began to take thyroid extract. In the course of six weeks she took between 110 and 120 thyroid gland tablets (Medix, strength No. 1, three tablets a day). She developed nervousness, insomnia, tremor, palpitation, dyspnœa, diarrhœa, profuse sweating, thirst, and faintness. Goitre appeared and exophthalmos was noted. She lost 21 kg. in weight during three months. The basal metabolic rate was 152 per cent. and the patient was regarded as a typical example of severe thyrotoxic goitre. She became delirious and later comatose and died seven months after beginning to take the thyroid.

Post-mortem examination. The thyroid gland was enlarged, without cysts or hæmorrhages. Microscopically, the follicles were of very unequal size. The epithelium was flat, cubical, or cylindrical. In most follicles papillomatous excrescences were found consisting of thin septa of fibrous tissue covered with flat or cubical epithelial cells. No colloid was found anywhere and there was no leucocytic or lymphocytic infiltration. Vascularisation was normal. The brain, cerebellum, and medulla oblongata were microscopically normal and sections from the cerebral cortex, optic thalamus and caudate nucleus, cerebellum, and from the borderline between the pons and medulla were all normal, except for a mild degree of hyperæmia.

*E. Møller's Case 2 (1930).*¹⁶—Male, aged 49. Developed myxœdema in 1913. From 1916 until 1924 thyroid extract was given in an average dose of 4 centigrammes daily. This removed all the symptoms and the patient was very well and able to work. In 1924, without any discoverable cause, palpitation, nervousness, feeling of heat, increased sweating, and tremor of the hands developed. The pulse-rate rose to about 90 and slight exophthalmos was noted. At the beginning of 1930 there was glycosuria. At this time there was bilateral exophthalmos with slight œdema of the eyelids and weakness of ocular convergence. Pulse-rate ranged between 90 and 100. There was slight rapid tremor of the hands. The thyroid was not markedly palpable. The urine was normal, except for an occasional, slight alimentary glycosuria. The blood-sugar was normal. The patient was nervous and restless. The basal metabolic rate was plus 78 per cent. The exophthalmometer measured: right 25 mm., left 24 mm.

*Moorhead's Case (1931).*¹⁸—Female, aged 54. In 1924 was considered to be suffering from myxœdema and thyroid extract was prescribed, with much benefit. At the beginning of 1926 the dose of thyroid extract was increased to grs. 12½ daily and this dose was taken continuously throughout that year. Early in 1927 it was noted that her right eye was much more prominent than her left. At this time the right eye was extremely prominent and showed well-marked von Graefe's sign, while the left appeared normal. The patient was extremely nervous and restless and suffered from insomnia and loss of weight. The pulse was rapid, the rate being 140. The thyroid gland could not be felt. The administration of thyroid extract was stopped and the patient was put to bed and treated with bromides. In two months the symptoms had largely disappeared and after six months the patient was practically well. As the general symptoms subsided the exophthalmos diminished but 18 months after the onset of hyperthyroidism the right eye was still somewhat more prominent than the left.

*Hurxthal's Cases (1931).*⁶—Hurxthal states that he was able to find 40 cases in which there seemed to be a history of dieting or the use of thyroid extract in patients suffering from exophthalmic goitre. Of this number, however, only 9 could be selected in which it was felt that there was no question as to the onset of exophthalmic goitre following one or other of these procedures. Of these 9 patients 7 had taken thyroid extract.

Hurxthal's Case 1.—Female, aged 33. In order to reduce weight took an unknown dose of thyroid extract for one year. Her weight fell from 180 to 130 lb. She developed typical exophthalmic goitre, with pulse of 92, basal metabolic rate plus 36. Subtotal thyroidectomy was performed and one year later weight was 162 lb., pulse-rate 68, basal metabolic rate plus 20.

Hurxthal's Case 2.—Female, aged 51. Took 1 grain of thyroid extract daily for six months. Weight fell from 164 to 139 lb. She developed exophthalmic goitre. Pulse-rate was 76, basal metabolic rate (after Lugol's solution) plus 19. Subtotal thyroidectomy was performed. One year later pulse-rate was 68, weight 146 lb., basal metabolic rate minus 6.

Hurxthal's Case 3.—Female, aged 43. Took an unknown dose of thyroid extract for five months, in order to reduce weight. Weight fell from 162 to 131 lb. She developed a swelling of the neck and presented a picture of typical exophthalmic goitre with pulse-rate of 108 and basal metabolic rate plus 45. Subtotal thyroidectomy was performed and later the weight was 138 lb., pulse-rate 78, and the basal metabolic rate minus 12.

Hurxthal's Case 4.—Female, aged 38. Took thyroid extract in unknown dosage for three months. Weight fell from 165 to 135 lb. She developed typical exophthalmic goitre, with pulse-rate of 118, basal metabolic rate plus 18. Subtotal thyroidectomy was performed. Basal metabolic rate one year later was plus 5, pulse-rate 92, weight 145 lb.

Hurxthal's Case 5.—Female, aged 19. For two months took one tablet of thyroid extract three times a day in order to reduce weight. Weight fell from 180 to 165 lb. She developed a typical exophthalmic goitre, with marked exophthalmos, a large hyperplastic thyroid gland; the basal metabolic rate was plus 19, the pulse-rate 104. Subtotal thyroidectomy was performed. Six months later pulse-rate was 58, weight 187½ lb. and the basal metabolic rate minus 1.

Hurxthal's Case 6.—Female, aged 55. Took 2 grains of thyroid extract three times a day for seven months and lost weight from 191½ to 158½ lb. This patient developed the typical picture of toxic adenoma of the thyroid with a small firm gland, containing small adenoma and no exophthalmos. Her basal metabolic rate was plus 36, her pulse-rate 106.

Hurxthal's Case 7.—Female, aged 54. In order to reduce weight first took a restricted diet for six months. She lost 20 lb. and was then given thyroid extract for about six months. Six months after stopping the thyroid extract she presented the picture of severe exophthalmic goitre, with congestive heart failure and auricular fibrillation. Her weight was 142 lb., her pulse-rate 116, and her basal metabolic rate plus 58. Subtotal thyroidectomy was performed in two stages and one year later her weight was 148½ lb., her pulse-rate 96 and regular, and her basal metabolic rate minus 1.

It will be seen that exophthalmos is specifically mentioned as being present in only 1 of Hurxthal's 7 cases. It is noted as having been absent in 1 case and in the 5 remaining cases the condition was said to be one of exophthalmic goitre or typical exophthalmic goitre. It may reasonably be presumed that exophthalmos was present in these cases also. Hurxthal states that with the exception of one patient, who was not operated on, the typical pathological picture of hyperplasia of the thyroid was found, the glands being in all cases enlarged clinically and diffusely hyperplastic.

In the 19 reported cases thyroid extract was taken for obesity in 10, for myxœdema in 6, for goitre in 2, and for epilepsy in 1. In most cases the administration of thyroid extract appears to have initiated a condition closely resembling if not identical with exophthalmic goitre, which persisted or grew worse after withdrawal of the thyroid extract. In one case, E. Møller's Case 1, it proved fatal; in Hurxthal's cases it was treated by subtotal thyroidectomy, and

in Stegmann's case it was relieved by X ray irradiation of the thyroid. Pathological changes in the fatal case and in Hurxthal's cases appear to have been those of typical exophthalmic goitre. In 2 cases no mention is made of enlargement of the thyroid, and in 2 other cases there was a goitre before thyroid extract was administered. In the remaining cases the thyroid became enlarged in 10, while no enlargement was noticed in 5. In 2 cases in which the thyroid was not found to be enlarged, Moorhead's case and my case, the condition differed from typical exophthalmic goitre in that the patient began to improve as soon as the thyroid extract was withdrawn and made a recovery which was complete except for very slight residual exophthalmos. In 3 of the 19 cases the exophthalmos was noted as unilateral.

RÔLE OF THYROXINE IN THE PRODUCTION OF EXOPHTHALMOS

Since a very large number of persons take thyroid extract for long periods, some even in excessive doses, without developing exophthalmos, and since thyroxine fails to produce exophthalmos when given experimentally to normal animals, it seems probable that some other factor than the ingestion of thyroid extract or thyroxine is necessary in order that exophthalmos may develop. Recent experimental work yields some support for this view. Justin-Besançon, Kohler, Schiff-Wertheimer, and Soulié,⁷ working with dogs, have found it possible to produce exophthalmos by means of various drugs which stimulate the sympathetic nervous system. These workers have shown that such drugs differ from one another in their relative influence upon the eye and upon other structures innervated by the sympathetic. Thus the least doses of substances of the adrenaline group which had a powerful vasoconstrictor effect led to only a feeble exophthalmos. On the other hand, other sympathomimetic drugs, such as ephedrine or ephedrone, caused a very marked exophthalmos in doses which produced a rise of blood pressure equal to, or even less than, those obtained with adrenaline. Other drugs, such as tyramine, phenylethylamine and paramethylethylamine, fell between these two groups in their relative influence on the arterial pressure and on protrusion of the eyeballs. The same workers were unable to produce exophthalmos in dogs by means of thyroxine, even when given in large and repeated doses sufficient to cause rapid emaciation and a marked tachycardia. They found, however, that thyroxine appeared to sensitise the eye to sympathomimetic drugs, and that when thyroxine was given either before or after the administration of such a drug it was possible to produce exophthalmos by means of a dose of a sympathomimetic drug previously inadequate to do so or to obtain a much greater degree of exophthalmos than could be evoked by the sympathomimetic drug alone. Labbé, Villaret, Justin-Besançon, and Soulié⁹ have investigated this synergic effect of thyroxine upon sympathomimetic drugs in a patient who, in order to reduce her weight, took 10 mg. of thyroxine daily by the mouth. The patient soon presented signs of hyperthyroidism: severe and rapid emaciation, tachycardia, insomnia, and rise of basal metabolic rate, but at no time was there exophthalmos. They were able to produce a transitory exophthalmos, however, by giving to this patient on one occasion ephedrine and on another occasion ephedrone in combination with thyroxine. The same workers claim to have produced exophthalmos in a patient suffering from spontaneous hyperthyroidism but

without showing this symptom by the administration of ephedrine, and they quote an observation of Sainton²² on a myxedematous patient who developed exophthalmos when treated with thyroxine and adrenaline in combination.

These observations suggest that thyroxine while unable to produce exophthalmos alone can do so in combination with a substance capable of stimulating the sympathetic.

RÔLE OF THE THYROTROPIC HORMONE OF THE PITUITARY IN THE PRODUCTION OF EXOPHTHALMOS

The discovery of the thyrotropic hormone of the pituitary has opened a new road of approach to the problem of the pathogenesis of exophthalmos. Marine and his collaborators¹¹⁻¹⁴ in a series of experiments first found that bilateral exophthalmos could be produced in rabbits maintained on a diet of alfalfa hay and oats by means of the daily intramuscular injection of methyl cyanide. In such animals the exophthalmos was associated with thyroid hyperplasia, but the same workers found that exophthalmos was more easily produced and more marked in rabbits from which the thyroid had been removed. They next succeeded in producing exophthalmos in guinea-pigs by means of the administration of the thyrotropic hormone of the pituitary and found that exophthalmos occurred as readily and usually earlier in thyroidectomised than in intact animals.

Marine and Rosen conclude from these experiments that "the exophthalmos was brought about by the stimulating action of the thyrotropic factor of the anterior pituitary and that the thyroid gland took no positive part in causation." They consider that thyroidectomy stimulates the anterior pituitary to secrete more thyrotropic hormone. They found that removal of the superior cervical ganglion of the sympathetic abolished exophthalmos, whether caused by methyl cyanide or by the thyrotropic hormone of the pituitary, and conclude from this that the thyrotropic hormone causes exophthalmos by acting through a nervous mechanism.

Friedgood⁴ has observed the development of exophthalmos in 9 guinea-pigs out of 30 injected with anterior pituitary extract. In the first period following the beginning of daily injection of the extract, a prompt increase in the basal metabolic rate, associated with an increase in the basal pulse-rate and a decrease in the basal weight, was observed. The basal metabolic rate reached its maximum between the seventh and fourteenth day of treatment. After this the animal passed into a second period distinguished by a striking refractory state or remission, during which the basal metabolic rate returned to normal or might even fall below normal. Although slight prominence of the eyes occurred in several guinea-pigs towards the tenth day of the experimental period, when the basal metabolic rate was approaching its highest level, the exophthalmos was much more marked when it developed after the animal had entered the refractory period, and a striking exophthalmos was seen only in those animals which were injected over a period of several months, and especially in those which finally developed abnormally low basal metabolic rates. Friedgood concludes that these experiments indicate that the exophthalmos is produced independently of the thyroid secretion which causes the elevation of the basal metabolic rate, and that the anterior pituitary extract is more capable of inducing exophthalmos when the animal is not under the influence of hyperthyroidism but rather in a hypothyroid state. Scowen and Spence²³ also observed exophthalmos in 3 out of

14 guinea-pigs treated with the thyrotropic hormone of the pituitary.

RÔLE OF HYPOTHYROIDISM IN THE PRODUCTION OF EXOPHTHALMOS

The observation that hypothyroidism might, in certain circumstances, predispose to the occurrence of exophthalmos seems first to have been made by Kunde,⁸ who noted that although exophthalmos could not be produced in dogs by feeding with thyroid and only questionably in normal rabbits, marked exophthalmos developed when thyroid was fed to rabbits which had been rendered myxœdematous by thyroidectomy. Marine and his collaborators and Friedgood, in the experiments described in the previous section, observed that hypothyroidism exercised a similar predisposing influence on the production of exophthalmos by methyl cyanide and the thyrotropic hormone of the pituitary. The rare occurrence in man of progressive exophthalmos developing after subtotal thyroidectomy appears to be in some respects similar. Burch² has recently reported one case of this, Zimmerman²⁷ 8 cases, Naffziger¹⁹ one case, and Earnest and Serger³ one case. Naffziger and Jones²⁰ have discussed the surgical treatment of the condition. All these cases have been observed in the United States. I have seen two examples in this country. This condition will not be discussed in detail now as it is proposed to do this in a later communication. Its interest, for the present purpose, lies in the association between the development of exophthalmos and hypothyroidism. The usual sequence of events is as follows. A patient suffering from hyperthyroidism, with or without exophthalmos, undergoes subtotal thyroidectomy. Several months after the operation progressive exophthalmos develops, associated with ophthalmoplegia and, in some cases, with papilloedema and visual failure. This may occur when the patient is suffering from postoperative hypothyroidism as indicated by a subnormal basal metabolic rate, and it has sometimes followed the administration of thyroid extract in an attempt to correct postoperative hypothyroidism. Progressive exophthalmos occurring during postoperative hypothyroidism, recalls the experimental observation of Marine and his collaborators, and Friedgood, that exophthalmos could be produced by the thyrotropic hormone of the pituitary in animals that had been deprived of their thyroid glands or during a phase of relative hypothyroidism. Nevertheless, in some instances, the development of exophthalmos appears to have been precipitated or accelerated by the administration of thyroid extract in individuals during the phase of postoperative hypothyroidism.

Since thyroid extract is commonly administered either for the relief of myxœdema or in the treatment of obesity, it is naturally in these cases that we should expect to find examples of exophthalmos appearing after the administration of thyroid extract. Such cases cannot afford statistical evidence that hypothyroidism plays a part in the production of the exophthalmos. Nevertheless, in view of the experimental and clinical facts just cited, it is probable that it does so.

UNILATERAL EXOPHTHALMOS IN THYROTOXICOSIS

The exophthalmos, in the patient reported in this paper, was strictly unilateral. It is a minor puzzle that an ocular symptom associated with a state of general intoxication should sometimes be unilateral. In two other reported cases of exophthalmos following the administration of thyroid extract—H. U.

Møller's and Moorhead's cases—this symptom was unilateral. Unilateral exophthalmos sometimes occurs in spontaneous thyrotoxicosis. It was also rarely observed by Justin-Besançon and his collaborators in their experiments with sympathomimetic drugs, and Friedgood states that in all his guinea-pigs in which exophthalmos was produced by the thyrotropic hormone of the pituitary, the symptom was unilateral at some stage.

CONCLUSIONS

It is clear that the rôle of the thyroid in the pathogenesis of exophthalmos is by no means simple. Certain conclusions, however, can be drawn from the experimental and clinical facts already described. (1) The administration of thyroid extract or thyroxine to normal animals and human beings is not, as a rule, followed by the development of exophthalmos. (2) Exophthalmos can be produced experimentally by the administration to animals of drugs which stimulate the sympathetic nervous system. (3) Thyroxine appears to facilitate the action of such drugs in producing exophthalmos. (4) Exophthalmos can be produced by the thyrotropic hormone of the pituitary both in intact animals and in animals from which the thyroid has been removed, and there is some evidence that this hormone produces exophthalmos more readily in the presence of hypothyroidism. (5) Progressive exophthalmos may develop spontaneously following subtotal thyroidectomy in man even when the basal metabolic rate is subnormal, or may be precipitated in such individuals by the administration of thyroid extract. (6) Very rarely the administration of thyroid extract for the treatment of myxœdema, the relief of obesity, or some other purpose, is followed by the development of exophthalmos, and an example of this is reported. (7) It is probable, therefore, that when exophthalmos follows the administration of thyroid extract this is not a direct result of the action of the thyroid extract, but is due to some other substance which in certain rare individuals is produced in response to thyroid extract. Experimental evidence suggests that this substance may be the thyrotropic hormone of the pituitary.

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EARLY AMPUTATION FOR SEVERE CRUSHING OF LIMBS

A NOTE ON TWENTY CASES

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THIS paper is written with the object of encouraging very early amputation in cases where limbs have been severely crushed. The temptation to delay intervention is easily understood; the gravity of the injury dissuades the surgeon from advising the remedy of prompt amputation, even though the pulse be satisfactory and the patient's condition fair. If on the contrary the general condition is less favourable, there is unfortunately a still more plausible pretext for waiting. I have twice been persuaded to adopt this policy of delay, and I have watched the state of two patients, neither of whom was exsanguinated, change in a couple of hours—in spite of saline infusion and warmth—from "fair" to "moderate," and from "moderate" to moribund. Their deaths and the knowledge that others were dying in like circumstance led me to consider the possibility of saving life by very early amputation.

The theme is of course by no means new. Thirty-three years ago Harvey Cushing (Ann. of Surg., 1902, xxxvi., 321) made a clear pronouncement regarding primary amputation that is still admirably modern, but this teaching is far too often forgotten. I venture to give it fresh emphasis by the following review of a rather intensive experience.

In fourteen months (1933-34) I have collected 20 cases with severely crushed limbs, all of which were treated at Kasr-el-Aini Hospital by early amputation. Of these, 19 were consecutive cases in the surgical unit, and were amputated by me; one was operated on by my colleague, Dr. Zacharia, and is included through the courtesy of Dr. Abdel Wahab Mooro, F.R.C.S. This last—a striking case of double amputation—will be specially referred to below.

Of the 20 patients 2 died; one of them suffered from other fractures and a severe head injury; the other, a woman aged 50, had her thigh amputated. In this woman and in all the surviving cases, the dominant lesion was crushing of the limb; other injuries of small importance, except in one patient who had fracture of the contralateral femur.

The method of treating these cases at present employed in the surgical unit at Kasr-el-Aini has been gradually developed under the guidance of its director, Prof. A. K. Henry, from the experience summarised in the following paragraphs. I shall therefore describe it last.

DEFINITIONS

It is essential in the first place to define what is meant by severe crushing of a limb. Imbert in 1911 pointed out that many crushes carry in themselves little or no risk to life (Jour. de Chir., 1911, p. 365). Amongst these minor crushes he included those which affect the hand and the anterior half of the foot¹ Leriche in 1926 once more emphasised the fact that these injuries must not be called severe crushes—*grands écrasements*; he reserves this term for more proximal injuries which present the following five

characteristics: (1) laceration and extensive stripping of the skin; (2) pulping of the muscles; (3) lesions of important vessels; (4) lesions of important nerves; (5) comminution of bone. Each of the 20 cases in my series conformed to this description and I have grouped them as follows:—

Group I.—Severe crushes involving the entire foot requiring amputation in the leg (3 cases).

Group II.—Severe crushes in the leg or forearm requiring amputation at a more proximal level in the leg or arm (7 cases—2 of arm; 5 of leg).

Group III.—Severe crushes in the leg or arm requiring amputation in the thigh or arm, or double amputation of the leg (10 cases—1 of arm; 1 (double) of legs; 8 of thighs).

Causation.—The crushing injuries in this series were due to the following causes: tram-cars, 8; motor-cars, 4; falls from a height, 4; machines, 2; fall of a stone, 1; train accident, 1.

Age.—The average age of the twenty patients was 17½ years; fourteen of them were aged 13 or under.

Sex.—There was only one female in the series; she was aged 50.

GENERAL CONDITION OF PATIENTS WITH CRUSHED LIMBS

Pulse-rate on admission.—A striking feature is the number of cases that were admitted with relatively slow pulses, in spite of their severe crushes, and in spite too of their youth. Thus in 10 patients the pulse was under 100 on admission. (See Table.)

Group.	Pulse-rate on admission.		
	Average.	Maximum.	Minimum.
I. (3 cases) ..	98	109	92
II. (7 ,,) ..	95	110	74
III. (10 ,,) ..	96	120	70

Two time-intervals were recorded in each case: (a) the interval between the time of accident and the time of operation, and (b) the interval between the time of admission and the time of operation.

The *accident-operation interval* (a) was 3½ hours or under in all except three cases—two in Group I. with intervals of 5 and 4½ hours respectively, both of which came to operation with fast pulses, and one anomalous case in Group III. with an interval of 7½ hours. The average *accident-operation interval* in the entire series of 20 cases was just over 2½ hours.

The *admission-operation interval* (b) averaged just over 1 hour, with a maximum of 2 hours and 10 minutes, and a minimum of 15 minutes.

The *pulse-rate during the admission-operation interval.*—Observation showed that the pulse-rate during interval (b) increased in 10 cases, in spite of restorative treatment, remained unaltered in 3 cases, and diminished in 6 cases. (In one early case the preoperative pulse was not noted.) In one case of the ten, where the pulse-rate increased, the pulse, which on admission was 100, became imperceptible before operation. The average *rise* in the other nine cases was 24 beats, with a maximal increase of 73, and a minimum of 2. The average *fall* in 6 cases where the pulse-rate diminished was 9.8 beats with a maximal fall of 16 and a minimum of 2.

Note.—In two cases, though the pulse-rate observed immediately before operation was faster than it was on admission, there had been an *intermediate fall* in rate under the influence of restorative treatment. The best moment for intervention was therefore missed in these cases, though fortunately without fatal result.

¹ This distinction is essential. Prof. Henry, at a meeting of the Egyptian branch of the British Medical Association in 1930, showed five cases with tarso-metatarsal crushes—treated conservatively by local resection of the crushed tissues—which had run aseptic courses.

EFFECT OF DELAY IN AMPUTATION

It is shown above that the average admission-operation interval (b) was short—just over one hour. In three cases, however, this interval was unavoidably extended, as the theatres were all occupied. The effect of this enforced postponement was striking. The pulses, which had been relatively slow and favourable at the times selected for operation, rose in each case to an alarming frequency during the comparatively short period of delay. The following paragraph gives details of one such case.

GROUP III. (No. 22359).—Dr. Zacharia's case of double amputation. Male, aged 12. Tram-car accident, Dec. 9th, 1933. Crush of the middle and upper part of right leg; continuity only maintained by skin. Left foot stripped of soft tissues, also left leg to level of lower third. Pulse on admission 100 (Temp. 36.8° C.). Accident-operation interval 1 hour 50 mins. Operation was fixed for half an hour after admission. Pulse at this time was still 100 and of fair tension. Operation had to be postponed for an hour. During this hour the pulse became imperceptible. Under ether, disarticulation at right knee; amputation at the middle of left leg. Duration of operation 30 minutes. Pulse again became countable at 140 about 20 hours after operation. Re-amputation, right thigh, on Feb. 21st, 1934. Discharged, healed, after 80 days.

Two other "delayed," but ultimately successful cases—one of the patients, besides a pulped right foot and lower third of leg, had fracture of the left femur—showed similar alarming accelerations. Thus in three patients when amputation could not be performed at the time fixed, the pulse-rate rose respectively in 2 hours from 96 to 140, in 1½ hours from 102 to 175, and in 1 hour from 100 to "imperceptible."

It will be seen therefore that these cases of postponed amputation serve, though unintentionally, as control experiments. They suggest two conclusions regarding the early treatment of severely crushed limbs. (1) When the pulse is favourable the opportunity of amputation should be seized at once. (2) Amputation will give patients with fast, or even imperceptible, pulses a chance—I think their only chance—of survival, provided always that these signs are due primarily to the crushing injury of the limbs themselves and not to manifest hæmorrhage or lesions in other parts.²

IMMEDIATE EFFECT OF EARLY AMPUTATION

The immediate effects of the operation seldom cause alarm. As a rule there was only a small increase in the pulse-rate, and a slight fall in blood pressure. In the most serious cases, too, where amputation was performed whilst the pulse was already poor and fast, the condition was no worse after it. Thus the average increase of pulse-rate taken immediately after operation in eighteen cases was 16 beats with a maximum of 60 and a minimum of *minus* 20—the pulse-rate falling 20 beats after operation. Other large rises of 60, 45, and 40 beats were recorded, the last in the fatal case with head injury, while the first two occurred in cases where the *time of operation was prolonged to 40 minutes*. In these two patients the pulse-rates had fallen during the admission-operation interval from 84 to 70, and from 88 to 75. A slow pulse therefore is no excuse for slow surgery in a case of crush. Operation, however, is sometimes prolonged (1) by the presence of multiple injuries, and (2) by mistaking a crush for a mere compound fracture; time is then wasted over local

² One anomalous case already referred to had a long accident-operation interval, 7½ hours. During the hour between admission and operation the pulse-rate remained at 110. The case is mentioned to show that exceptions occur. Rare exceptions, however, are unpredictable and give no excuse for delaying amputation.

treatment till the surgeon discovers that injured vessels and nerves call for amputation.

The average blood pressures taken immediately before and after operation in fourteen cases were respectively 115/70 and 100/60, an average fall of 15/10.

In view of these facts we can regard early, rapid, and simple amputation in cases of severe crush as relatively shock-free.

Treatment of Severe Crushes

To obtain this benign effect in amputation for crush it is necessary to insist on three things: (1) restorative treatment before and during operation; (2) proper anaesthesia; and (3) early and rapid intervention.

VALUE AND LIMITATIONS OF RESTORATIVE TREATMENT

Restorative treatment must never be omitted; on the other hand, if the patient fails to show a quick and favourable response, it must not be allowed to delay amputation. In those cases, too, which are unfavourable, either because of the proximal level of the crush, or because they come too late to hospital, the patient should be taken at once to the operation room, which, we have learnt, need *not* be an orthodox theatre. Such patients often require treatment nearly as urgent as that for hæmorrhage. The following example shows that there is no place for any refinement that will cause delay.

A man was brought into another service with both thighs crushed. The pulse-rate on admission was only 75. The case was marked "for immediate operation," but in the 30 minutes which elapsed while the theatre was prepared the pulse became uncountable, and amputation failed to save him.

After this event orders were given in the surgical unit that cases with severe crush must be taken to the first room available. There they are at once put under an electric cradle and given a large subfascial infusion of saline. Morphine gr. ¼ to ½, or codeine gr. ½ to 1 is administered according to age. Simultaneously—and this we think vital—local anaesthesia with novocain is begun so that the limb shall be ready for the first incision 20 minutes from the moment the patient enters the hospital. During this time instruments can if necessary be flamed.

ANÆSTHESIA

We have come, in the surgical unit, gradually to rely on novocain infiltration in performing these amputations. Novocain alone was employed first in this series in a Group II. case on Feb. 9th, 1934. We use from 80 to 150 c.cm. of novocain in ½ per cent. solution, with 7 drops of 1/1000 adrenaline per ounce, or 30 c.cm. The infiltration must be given time to effect full analgesia, for no pain whatever must be caused by the operation. It is instructive to keep a finger on the pulse throughout one of these amputations in a "poor risk" and to note how any painful, unblocked, stimulus will tend to make it imperceptible. With full analgesia, on the other hand, the pulse often remains unaltered, and indeed will sometimes improve.³

Technique.—A wide, encircling, weal is made in the skin; this requires from 20 to 40 c.cm. of novo-

³ Since this was written improvement in pulse and blood pressure has been noted immediately after operation under novocain by my successor in the surgical unit, Dr. M. H. el Zeneiny, in a most unpromising case of double leg-amputation which recovered. Dr. Botros Salib, resident surgeon at Kasr-el-Aini Hospital, through the courtesy of Dr. N. Makar, F.R.C.S., in November, 1935, reports a remarkable case (1935, No. 20999) in a patient, aged 15, where an uncountable pulse became 150, and an unregistrable blood pressure, 90/50, after a double thigh-amputation which he performed under gas-oxygen anaesthesia, according to the "urgent" technique described in this paper. The child recovered.

cain solution. The needle is then directed towards the principal nerves, and at least 10 c.cm. is injected into the neighbourhood of each. This quantity (80 c.cm.) is in general sufficient for full analgesia. An adult thigh, however, may require more novocain—up to 120 c.cm.

If the patient is nervous he may have gas-and-oxygen just before sawing the bone. This was given in this series first to a Group III. case on June 25th, 1934. It is surprising how often the operation can be completed under novocain only without distressing the patient.

Intra-neural injections are made individually into the nerves before they are divided, and it is important to inject each nerve once more at a higher level, when it is drawn down from the face of the stump, before it is finally severed in the attempt to avoid terminal neuroma.

Difficulties arise when other wounds require cleansing and excision. In such cases we prefer to administer gas-and-oxygen (or, as a second choice, ether) *in addition* to the novocain infiltration described above.

I have pointed out that the resistance of a patient with severe crush may be extremely frail though his pulse be slow and his blood pressure normal; it will soon break down if the operation lasts much beyond half an hour. For this reason when there are multiple injuries more than one operator should work at the same time.

THE AMPUTATION

The amputation in order to be rapid should be simple, and in some of the earlier cases guillotine amputations were performed. Little more time, however, is required for a circular amputation in the thigh, arm, or forearm, and for a flap amputation of the leg.

It is essential, because of the hurried and therefore incomplete preparation of the skin, to use a separate knife for dividing the deeper tissues. A couple of catgut sutures approximate muscles and fascia. The skin is closed with a few Michel clips to avoid bearing infection in from without by sutures. The wound is drained with half a split rubber tube. A good dressing for the stump is the sterile boric powder recommended by Sir Robert Jones.

Conclusions

1. Severe crushing injuries of the limbs can be clearly defined and are to be distinguished from minor crushes. Major crushes carry in themselves a grave risk of early death if amputation is not performed.

2. These serious injuries are compatible for a brief period with slow pulses and good blood pressures.

3. A slow pulse and good blood pressure indicate the moment of choice for intervention. This moment will soon pass.

4. The lives of patients with fast or even imperceptible pulses can be saved by immediate amputation when these signs are due to the presence of crushed tissues in the limbs and not to grave injuries elsewhere, or to external hæmorrhage.

5. Amputation therefore should be performed at the very earliest opportunity in every case of severe uncomplicated crushing of the limbs.

6. On admission to hospital the patient is brought at once to the first room available for performing amputation.

7. Restorative treatment and novocain analgesia are to be administered *simultaneously*, and the patient's limb or limbs should be analgesic and ready for

amputation within 20 minutes of his arrival in hospital.

8. Other injuries requiring general anæsthesia (gas-oxygen) for their treatment should, if possible, be dealt with during the amputation by another operator, and every effort must be made to limit the operative part of the treatment to less than half an hour.

9. Amputation under full novocain analgesia is a benign measure that does not shock the patient.

GALLOP RHYTHM AND THE PHYSIOLOGICAL THIRD HEART SOUND*

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DEFINITION

UNDER certain conditions three instead of two sounds accompany each heart cycle. The familiar "lūb dūp," then becomes either "lūb dūpp dūpp" or "lūb lūb dūpp." From its resemblance to the sound made by a galloping horse, this triple rhythm has been called "gallop." When the additional sound follows closely on the second heart sound (Fig. 1B) the gallop is termed "protodiastolic," but when it immediately precedes the first heart sound (Fig. 1C) it is termed "presystolic."

My object in this communication is to point out the importance of distinguishing between the two types of triple rhythm. They are fundamentally different from one another.

The one is physiological; the other pathological. Protodiastolic gallop is quite compatible with perfect health. Presystolic gallop, on the other hand, is a sign of grave prognostic significance. It has been called "the cry of the heart for help." It warns us that the last reserves have been called up, and that the heart is struggling against desperate odds.

PRESYSTOLIC GALLOP—CLINICAL FEATURES

Let me give some actual figures in support of this statement.

In a consecutive series of 1353 cardiac cases seen in private practice during the three-year period 1930-32, I noted the presence of presystolic gallop in 63 patients. Of these, 1 has been lost sight of, 55 are now dead, and only 7 are still alive. That, I think you will agree, is sufficient evidence of the gravity of this sign in prognosis.

Only 15 of these 63 patients lived for more than

* Based on a paper read at the section of medicine at the annual meeting of the British Medical Association at Melbourne, 1935.

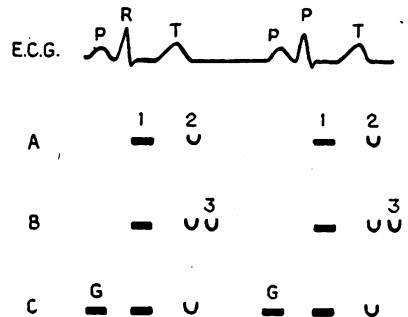


FIG. 1.—Purely diagrammatic representation of heart sounds, to illustrate time relation of accentuated third heart sound (3) and gallop sound (G) to first (1) and second (2) normal heart sounds.

E.C.G. = Electrocardiogram. A = Normal heart sounds. B = Protodiastolic gallop. C = Presystolic gallop.

eighteen months after gallop was first noted. Table I. shows the duration of life in these patients.

TABLE I

Less than 1 month	..	..	..	16
1- 6 months	..	..	..	19
6-18 "	..	..	..	12
More than 18 months (now dead)	..	..	..	8
" " 18 " (still living)	..	..	..	7
				62

When one compares the 15 survivors with the 47 who died during the same period (Table II.), one is

TABLE II

Age.	Lived for more than 18 months.	Died within 18 months.	Total.
Under 47	—	16	16
47-49	2	4	6
50-59	6	13	19
60-68	7	9	16
Over 68	—	5	5
—	15	47	62

struck by the fact that all the survivors were between the ages of 47 and 68. It is not unexpected that the 5 patients over that age should have died, but it is rather surprising that not 1 of the 16 patients under 47 years of age should have survived.

The explanation of the very high mortality amongst the younger patients is that gallop rhythm may develop in association with several different types of heart disease (Table III.). Acute endocarditis and chronic Bright's disease with high blood pressure accounted for 10 of the 16 deaths amongst the younger patients in my series; whereas, amongst the

TABLE III.—Died within eighteen months

Age.	Over 47.	Under 47.	Total.
Essential hypertension	11	2	13
Coronary arterio-sclerosis	12	1	13
Chronic nephritis	1	4	5
Acute infections	0	6	6
Miscellaneous	7	3	10
—	31	16	47

older patients, essential hypertension and coronary arterio-sclerosis were the conditions most commonly found. These are more chronic diseases, and this appears to be the reason why the immediate prognosis in patients with gallop rhythm is rather less grave in the sixth and seventh decades than during the earlier period of life.

Twenty-six patients in this series exhibited signs of heart failure with venous engorgement; 25 of these had regular heart action. This is a very significant clinical observation, for congestive heart failure is notoriously much more common in association with auricular fibrillation than with normal rhythm. The finding of normal rhythm in association with congestive heart failure, in these cases, suggests that contraction of the auricle is essential to the production of gallop, and that presystolic gallop is incompatible with auricular fibrillation. This hypothesis is corroborated by the fact that, if a patient with gallop rhythm develops auricular fibrillation, the gallop always disappears, but will recur if normal rhythm is restored.

MECHANISM OF PRESYSTOLIC GALLOP

Further corroborative evidence concerning the rôle of the auricles in the production of gallop is derived from experimental observations. All workers

who have studied this problem by means of graphic records have found that the third sound in gallop is always synchronous with auricular systole.

Fig. 2, which is taken from one of many similar records made from my own cases, serves to illustrate this point. The upper tracing is an electrocardiogram and the lower a record of the heart sounds. The vibrations of the first heart sound (1) correspond in time to the R wave of the electrocardiogram, those of the second sound (2) to the T wave, and those of the gallop sound (G) to the succeeding P wave.

In order to explain the part played by auricular contraction in the production of gallop rhythm, I must briefly refer to certain events which take

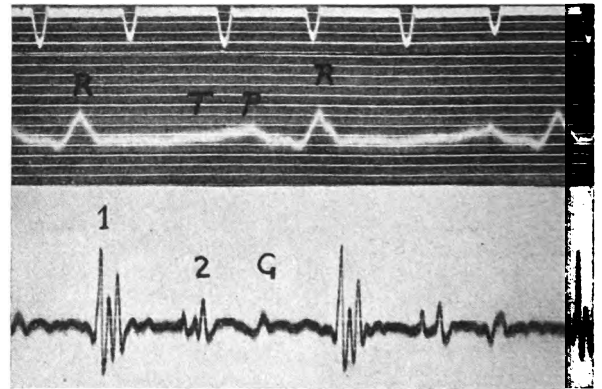


FIG. 2.—Electrocardiogram (unstandardised) and phonocardiogram from a patient with gallop rhythm, to illustrate the time relations of the first (1), second (2), and gallop (G) sounds to the R, T, and P waves of the electrocardiogram.

place during the cardiac cycle. For this purpose it is convenient to divide that portion of diastole which follows the opening of the mitral and tricuspid valves into three stages—early, middle, or late diastole. When the mitral valve first opens † the pressure in the auricle is much higher than that in the ventricle, and during early diastole blood is rushing, with considerable velocity, through the mitral orifice. During mid-diastole, the rate of blood-flow from auricle to ventricle is greatly reduced, and the pressure in both chambers rises very slowly as blood flows in from the great veins. The third and final stage of diastole is occupied by contraction of the auricle. When this occurs, there is a sudden rise in the auricular pressure, and the rate of blood-flow through the mitral orifice is again increased. It is important, however, to remember that by the time the auricle contracts the ventricle is generally so full that it is capable of accepting very little more blood. I would ask you to note especially, that the most rapid filling of the ventricle occurs during early diastole.

That is what happens when the heart is beating slowly. Let us now see how this is modified when the heart beats more rapidly. The three records in Fig. 3 were made on myself during the period of recovery from an inhalation of amyl nitrite.

The upper tracing in each record is an electrocardiogram, the lower one a sphygmogram. In the first record, the heart was beating at a rate of 130 per minute. In the second record, taken 30 seconds later, the heart-rate had slowed down to 110; and in the third record, taken four minutes later, it had returned to normal, and was beating at 73. In the corresponding diagrams, I have represented by black rectangles auricular and ventricular systole, as measured from the electrocardiograms. You will see that, when the heart-rate is 73, auricular and ventricular

† The same applies to the right side of the heart.

systole are separated by a time interval of more than three-tenths of a second, whereas, when the heart-rate is 110, the interval is reduced to about one-tenth of a second; and, when the heart-rate is 130, there is no interval at all, auricular systole following immediately on ventricular systole.

In other words, in the first record, the entire diastolic portion of the ventricular cycle is occupied by auricular systole, and, even in the second record, auricular systole occurs very early in diastole. Now what is the significance of this? It means that when the heart is beating quickly, the rate of blood-flow from auricle to ventricle, which normally is most rapid during early diastole, is still further accelerated by contraction of the auricle. This I believe to be a factor of primary importance in the production of gallop rhythm. The abnormally rapid rate of ventricular filling causes sudden distension of the ventricle. This sets its walls into vibration, and so produces a pre-systolic sound. It does more than that. It produces a palpable pre-systolic impulse, to which I shall refer again.

But that, is obviously not the whole story. If it were, every patient with tachycardia would exhibit gallop rhythm. A second factor is essential—namely, a lack of tone in the ventricular muscle. Whereas the healthy ventricle is able rapidly to accommodate itself to sudden changes in the volume of its contents, the muscle of the ventricle which is lacking in tone is unable to do so. If suddenly stretched, it will oscillate to and fro.

This association of heart failure with tachycardia accounts for the grave clinical significance of gallop. The appearance of gallop means that the stroke volume of the failing ventricle is reduced to such an extent that the heart is no longer able to maintain an adequate output per minute, except by increasing its rate.

To sum up, I believe that the additional impulse

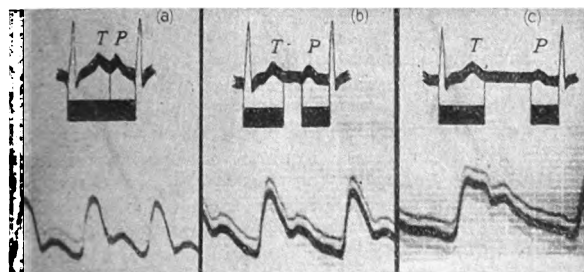


FIG. 3.—Electrocardiograms and optical carotid pulse tracings taken during recovery from an inhalation of amyl nitrite, to illustrate the curtailment of diastole during the tachycardia; (a) 80 seconds after commencement of inhalation, (b) 110 seconds after commencement of inhalation, (c) 360 seconds after commencement of inhalation.

in presystolic gallop is produced by sudden distension of the hypotonic ventricle and the additional sound by vibrations of the ventricular wall, both these phenomena being the result of the abnormally rapid rate of filling of the ventricle, when contraction of the auricle occurs early in diastole.

Other hypotheses.—It has been suggested that gallop rhythm may be due either to partial heart-block or to bundle branch block. My observations lend no support to this hypothesis. In my series,

partial heart-block was present in only 1 of the 33 cases in which an electrocardiogram was obtained. Bundle branch block, on the other hand, was relatively common. It was present in 7 of these 33 cases. This association, therefore, appeared to merit further inquiry. As a control, I examined all the electrocardiograms taken in the 1353 patients amongst whom my 63 cases of gallop occurred, and I found that there were 9 cases of bundle branch block without gallop rhythm. Thus neither did the majority of patients with gallop rhythm exhibit bundle branch

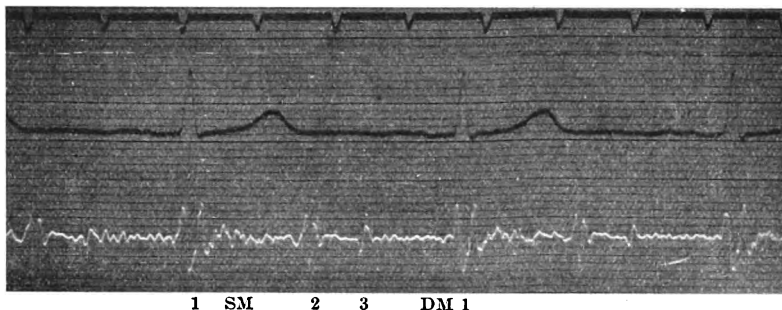


FIG. 4.—Electrocardiogram and phonocardiogram, from a patient with advanced mitral stenosis. (1) First heart sound (SM) systolic murmur, (2) second heart sound, (3) third heart sound, (DM) diastolic murmur.

block, nor did the majority of those with bundle branch block exhibit gallop rhythm. That bundle branch block and gallop rhythm should often occur together is not surprising, for both are signs of grave myocardial damage. There is, however, no evidence of a causal relationship between these two signs.

ACCENTUATION OF PHYSIOLOGICAL THIRD HEART SOUND

Let me now turn to the consideration of the "protodiastolic" type of gallop—the type in which the additional sound follows closely on the second heart sound (lūb, düpp, düpp). The term "protodiastolic gallop" is a bad one, because the epithet "protodiastolic" is used by physiologists to describe that phase of the cardiac cycle which immediately precedes the closure of the semilunar valves, whereas the additional sound in protodiastolic gallop occurs not before, but about one-tenth second after, the closure of these valves. There is a second objection to the term protodiastolic as applied to gallop. When the heart-rate is rapid, contraction of the auricle takes place early in diastole (see Fig. 3). Presystolic gallop then becomes "protodiastolic" in time. Actually the additional sound in protodiastolic gallop is nothing more nor less than an accentuated physiological third heart sound. Much confusion would be avoided if it were so called, and if the term "gallop" were reserved for the presystolic variety.

Now what is this "physiological third heart sound"? In many perfectly healthy young people, three instead of two heart sounds can be heard. The third heart sound is rather faint, and occurs about 1/10th sec. after the second heart sound. It can be brought out by any procedure which increases the rate of venous return to the heart, such for example as exercise or elevation of the limbs.

Thayer † of Baltimore studied this problem both clinically in man and experimentally in animals. In a series of 231 healthy young persons whom he examined, Thayer found that a third heart sound

† Thayer, W. S.: Trans. Assoc. Amer. Phys., 1908, xxiii., 326; 1919, xxiv., 71.

was present in 65 per cent. He also demonstrated the presence of a similar sound in dogs. This sound corresponded in time to the sudden distension of the ventricles which occurs early in diastole. He suggested that it was produced by vibration of the valve cusps, set up by the first rush of blood from auricle to ventricle.

This type of triple rhythm is always best heard in the vicinity of the cardiac apex. It can therefore easily be distinguished from that due to a "split" second sound produced by asynchronous closure of the aortic and pulmonary valves, which is audible only over the base of the heart. The third heart sound is a perfectly normal phenomenon. It has no pathological significance.

To sum up, I believe that the physiological third heart sound is produced by vibration of the A.V. valves, whereas the gallop sound is due to the vibration of the wall of the atonic ventricle. Further, the physiological third heart sound results from an acceleration of the blood-flow from auricle to ventricle, when the rate of venous return to the heart is increased, whereas the gallop sound is due to sudden distension of the ventricle, when the auricle contracts early in diastole.

Now how can we distinguish clinically between presystolic gallop rhythm and an accentuated third heart sound? In the first place, the gallop sound is generally accompanied by a palpable diastolic impulse, whereas the third heart sound is not. The normal cardiac impulse is a single thrust. The gallop impulse is a double wave. This gives to the hand the impression of a damped oscillation of the chest wall. Secondly the sounds in gallop (lūb, lūb, dūpp) are almost evenly spaced; whereas the accentuated third heart sound (lūb, dūpp, dūpp) is obviously more closely related to the preceding second than to the succeeding first heart sound. Lastly, the accentuated third heart sound is frequently present in patients with auricular fibrillation, whereas fibrillation and gallop never occur together.

Mitral stenosis.—Fig. 4 is taken from a patient with mitral stenosis. It shows the accentuated first heart sound and the duplicated second sound characteristic of that condition. It will be observed that the first component of the second sound is synchronous with the end of ventricular systole as indicated by the T wave in the electrocardiogram, and that the second component occurs about 1/10th second later. This second component is merely an accentuated third heart sound; it bears no relation to the P wave in the electrocardiogram, as was the case with the gallop sound. On the other hand, it does bear a constant relation to the preceding second heart sound, since it is synchronous with the opening of the mitral valve which follows the closure of the semilunar valves by about 1/10th second.

Although mitral stenosis is the condition par excellence in which to listen for an accentuated third heart sound (or, as it is commonly called, a "reduplicated second sound"), I have never met with presystolic gallop in a patient with this lesion. The explanation of this incompatibility is twofold. In the first place, gallop rhythm occurs only when heart failure is present or imminent. Now heart failure, in patients with mitral stenosis, is almost always the result of auricular fibrillation. This complication, as we have seen, excludes the possibility of gallop. Even in those very rare cases of mitral stenosis with heart failure and normal rhythm, the conditions present are such as to prevent the development of gallop. As I have pointed out, rapid filling of the ventricle is essential to the production of gallop,

but rapid filling of the ventricle cannot occur when the mitral orifice is stenosed.

CONCLUSION

In conclusion let me once again emphasise the grave significance of presystolic gallop, and the importance of distinguishing it from that type of triple rhythm which is due to accentuation of the physiological third heart sound.

SONNE DYSENTERY IN A MENTAL HOSPITAL

By J. J. LAWS, M.R.C.S. Eng., D.P.M.

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OUTBREAKS of dysentery due to infection with *Bacillus dysenteriae* Sonne have been described with increasing frequency in many parts of the world since Sonne in 1915 demonstrated that this organism is a cause of the disease. Many of these outbreaks have mainly affected children,^{1,2} but one of them,³ in a hospital staff, was confined to adults and clinically showed considerable similarity to the outbreak at Horton Mental Hospital. A prominent feature of the Horton epidemic was its high infectivity among the patients, although no member of the staff was taken ill. The first cases occurred in three adjacent wards on the male side, but almost at once further cases of the same type manifested themselves in widely separated parts of the hospital, and efforts to control the spread of infection were unavailing. Strict isolation of cases was practised from the beginning and possible causes of propagation—such as contaminated food or water-supply and inadequate treatment of foul linen—were investigated with negative results. The origin of the infection could not be discovered. It may have been previously present in a mild or symptomless form, as in some of the cases in the outbreak described by Felsen and Osofsky.⁴ The epidemic lasted some six weeks—from the latter end of March, 1935, until the middle of May—and was followed by a further slight outbreak at the end of June and the beginning of July. In all 113 cases were recorded during the main epidemic, and bacteriological investigations were made on 75 of these.

It is probable that in an outbreak of such proportions, occurring among the insane, a number of mild or possibly symptomless cases were missed, and this may explain the wide spread of the infection. Reference to carriers among patients in mental hospitals is made by Gardner⁵ who, in discussing so-called "asylum dysentery" quotes the opinion expressed by H. S. Gettings "that carriers are the main source of infection." A questionnaire on carriers circulated by a research subcommittee of the Royal Medico-Psychological Association⁶ showed that ten hospitals recorded carriers of both typhoid and dysentery—three of dysentery only—in all 28 cases. Although the infection appears to have been of the Flexner type, the same may well be true of Sonne dysentery.

Clinically the disease, though acute at the onset, was relatively benign and there were no deaths from the dysentery itself, although it appeared to hasten the death of a number of previously debilitated patients. The principal points in the clinical picture were a sudden onset, mostly with a sharp rise of temperature, varying from 99° F. to 104° F. (60 per cent. of the cases); vomiting (23 per cent.) often with considerable prostration; and abdominal pain and

discomfort (20 per cent.). About 90 per cent. of the patients had diarrhoea commencing at the onset; the motions were numerous and small, containing mucus, and in 23 per cent. of cases traces of blood. As a rule the temperature dropped in 24-48 hours, and the acute symptoms subsided in 1-7 days. The acute stage was often followed by obstinate constipation as noted by Fraser and Smith¹ at Aberdeen. In a few cases the illness was somewhat longer, but in these it was not necessarily more severe; indeed, many of those of short duration had a sharper reaction. Recovery was usually rapid and complete.

This description of the clinical findings is essentially similar to that given by other authors. In their "severe adult type" Felsen and Osofsky⁴ describe a sudden onset, high temperature, vomiting, prostration, and bloody diarrhoea. In their general description of clinical manifestations Fraser and Smith¹ note a temperature of 99°-103° F. (53 per cent. of cases) for 24-48 hours, vomiting (94 per cent.), diarrhoea (91 per cent.), blood in stools (13.5 per cent.), and abdominal pain (32.1 per cent.). Cann and Navasquez³ describe giddiness and malaise, abdominal discomfort and diarrhoea, and pyrexia (never over 101° F.) with return to normal in 48 hours—a slightly milder type of the disease.

BACTERIOLOGICAL INVESTIGATION

Specimens of faeces were obtained from each patient and inoculations were made on plates of McConkey's medium. Most of the plates grew *Bacillus coli* in abundance, but certain of them showed small pale colonies of a non-lactose-fermenting type. These were picked off, sub-cultured into broth, and also used for inoculating sugars. Specimens from 16 cases were thus examined, and of these 7 gave positive fermentation and agglutination reactions. In the fermentation tests lactose did not show the typical reaction (acid without gas) until the seventh day, and saccharose not until the tenth to twelfth day. Agglutination was also somewhat delayed, and it was found necessary to subculture in broth several times before a positive result could be obtained, with titres varying from 1 in 500 to 1 in 1250.

In view of the fact that fermentation was a lengthy procedure and that one was apparently dealing with an outbreak of Sonne dysentery, further investigations were limited to plating on McConkey's medium, and agglutinations of broth cultures, as advocated by Gardner.⁵

In all some 75 cases (66 per cent. of total) were investigated by cultural methods, of these 22 (30 per cent.) showed the Sonne organism. The positive results might have been higher if it had been possible to make more than one culture in each case. About seven weeks after the commencement of the outbreak the decline in the number of fresh cases made it possible to undertake a second investigation, and a single specimen was again examined from 70 of the original cases. Only 3 of these gave a positive result—four weeks, three weeks, and one week after the onsets.

It is generally agreed that as a rule the organisms disappear rapidly from the stools. Cann and Navasquez³ say "a few days"; Fraser and Smith¹ state that of 53 cases 41 were negative in a week. Of the remainder, 4 were negative by the second week, another 4 by the third week, and 3 more by the fourth. Only 1 was positive for seven months.

In the early stages of the investigation serum agglutination tests were made on a few cases. Ten sera were thus tested within a fortnight of the onset, and nine of these gave a positive reaction with titres varying from 1 in 25 to 1 in 600. A more complete investigation was made later, at the same time as the second examination of faeces—seven weeks after the commencement of the outbreak. Of the original 113 cases 83 were examined, and of these 51 (60 per

cent.) were positive, 41 of them at a titre of 1 in 125 (the highest dilution used). In all agglutination tests standard suspensions and sera only were used.

THE SECOND OUTBREAK

As previously mentioned the second outbreak was small, being confined to a single ward. Cases had occurred there previously, but had always been transferred to isolation, and there had been no fresh cases, either in this ward or elsewhere, for about six weeks. Ten patients were affected during a period of three weeks. They all showed the usual clinical symptoms and were at once removed to isolation. Sonne's bacillus was isolated in only two cases, but clinically there was no doubt of the diagnosis in all the ten patients. The stools of the 48 patients remaining in the ward were also investigated—a single culture only being made in each case, with the interesting result that three hitherto unsuspected cases were found to be harbouring Sonne's bacillus.

Although these patients never showed clinical symptoms, precautionary measures were taken and the stools of each of them were examined again on eight separate occasions during the following six weeks. Two were found to be still positive at the end of a month; thereafter all three were negative. In view of this evidence of infection in patients showing no clinical symptoms, it was decided to carry out serum agglutinations on as many as possible of the 48 cases in the ward, all of whom might presumably have been exposed to the risk of infection. A total of 34 sera were tested and 25 of these (including the three culturally positive cases) proved positive in dilutions varying from 1 in 25 to 1 in 1250. As, however, a small dose (125 million organisms) of a prophylactic vaccine had previously been given to 13 of these 25 cases (again including the three with positive cultures) the value of these results is somewhat doubtful. It is of more significance that of the 21 cases not vaccinated a positive result was obtained in 12—nearly 60 per cent.

CONCLUSIONS

Sonne dysentery is a disease of high infectivity, usually acute in onset and of moderately benign course. Most cases soon become free from infection, but a small number continue to harbour the bacilli, while others pass organisms in the stools without having shown any clinical symptoms. Both these forms of carrier may play a large part in spreading the disease.

Agglutination of standard suspensions of Sonne's bacillus by patients' sera can be obtained in a large proportion of cases showing clinical symptoms, even if culture has proved negative, and also in some cases in which there is no clinical evidence of the disease. In the former type agglutination is valuable in confirming a diagnosis, while in the latter it is possibly useful in detecting carriers or latent cases.

I wish to thank Dr. W. D. Nicol, medical superintendent of Horton Mental Hospital, for his kind encouragement and for permission to publish these cases, and also Dr. S. A. Mann, of the L.C.C. Central Pathological Laboratory, Maudsley Hospital, for his help and advice.

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SARCOMA OF THE DUODENUM

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SARCOMA of the duodenum is rare, and comparatively few cases have been reported. As Rolleston¹ has pointed out, sarcomata involve the duodenal tract more extensively than carcinomata; and in sarcoma dilatation due to softening by the growth occurs, whereas in carcinoma obstruction is commoner. Very few cases of primary sarcoma have been described and therefore it is difficult to form conclusions. We have discovered the following recent records:—

Strauss et al.² describe a lymphosarcoma of the duodenum located distally to the ampulla of Vater. The patient survived two years after a gastro-enterostomy and a course of deep X ray therapy.

In the radiographic diagnosis of duodenal tumours Brdiczka³ points out that of 84 cases of intestinal myoma, only 6 were found in the duodenum. He quotes a case of myosarcoma of the duodenum in a female of 60, who died suddenly from lung embolism a week after operation. The tumour was situated in the right epigastrium, was attached to the bulb of the duodenum, and was the size of a foetal head. There were no metastases, and the gall-bladder was not involved.

Pfundt⁴ reported a case of spindle-cell sarcoma of the duodenum occurring in a female aged 41. She had had pain in the right epigastrium for a few weeks, and the pain was almost continuous. She had lost 20 lb. in weight—there was no vomiting or nausea. Her general nutrition was good and there was no distension of the abdomen. A tumour the size of an orange was found in the right epigastrium and appeared to be attached to the liver. A blood count showed 10,800 leucocytes. At operation the tumour was found to be a large thick-walled tumour, filled with cysts, attached to both the gall-bladder and the pars superior duodeni. Processes of the tumour, 2–3 cm. long, were found infiltrating the lumen of the duodenum. The duodenal mucous membrane was normal, and after closing of the abdomen the patient made an uneventful recovery.

LaRoque and Lee Shiflett⁵ reported the case of a female, aged 48, who complained of a mass in the upper thigh. Various small nodules had been removed during the previous thirteen years. There was a history of previous gastric trouble consisting of gastric fullness, vomiting and pain, but no hæmatemesis. The patient was found to be emaciated and anæmic. The liver was large, and there was a palpable mass in the right upper quadrant. Radiography showed that the duodenal bulb was much dilated, and an abdominal operation revealed a hard tumour the size of a hen's egg inside the lumen of the duodenum. The pyloric portion of the stomach and the first three inches of the duodenum were removed. After temporary rallying the patient died suddenly from dilatation of the stomach. The tumour proved to be a spindle-cell sarcoma.

Libman⁶ has collected 54 cases of lymphosarcoma of the bowel—15 of which were in the duodenum. None of the patients were below ten years of age, and 9 between ten and twenty years. He states that sarcoma is very rare, and has not recorded any recoveries. Possibly its course may be delayed by X ray and radium therapy.

Andersen and Door⁷ recorded a case of a male, aged 37, who had had tarry stools for the previous seven weeks. This was associated with loss of weight, œdema of the lungs and feet, and a lump in the right side of the abdomen. No abdominal pains or fever. There was a tender swelling in the right upper abdomen which projected two inches below the margin of the liver; it was hard and irregular. This patient was not operated upon, and died six days after admission from shock following extensive hæmorrhage into the gastro-intestinal tract. At the autopsy

the tumour was found to involve the posterior aspect of the second portion of the duodenum and the posterior and inferior aspects of the third portion of the duodenum. The anterior surface of the duodenum was free. Histologically it was found to be a primary leiomyosarcoma; it had caused compression of the inferior vena cava and thrombosis of the iliac veins. The authors of this paper state that the only other case of leiomyosarcoma was reported by Salis in 1920.⁸ This case was that of a man, aged 40, who was found post mortem to have a large tumour attached to the duodenum above the duodeno-jejunal juncture. He had previously had an operation for gastric symptoms from which he recovered, leaving a tumour and fistula, and it was four months after the second operation for the removal of this tumour and fistula that he died.

Berstein records⁹ a case of myoma of the duodenal bulb, while Gehrig¹⁰ gives an account of polyposis of the duodenal bulb.

Our patient was a male, aged 38, and was first seen by one of us (M. H. F.) on Feb. 27th, 1934. He said that while dressing he had been seized with severe abdominal pain and had collapsed. There was no vomiting, but within a couple of hours he passed some large tarry stools. He had no previous history of ill-health and had never before suffered from any abdominal discomfort.

On examination he showed extreme shock; he was very pale and his pulse was hardly perceptible. Nothing definite was found on examination of his abdomen; there was no tenderness and no rigidity. On palpation per rectum nothing could be found, but proctoscopic examination revealed melæna. The heart sounds were normal and the blood pressure 100/70. He was first of all treated for shock with atropine and camphor, and heat was applied externally. Heart stimulants were given by mouth, and during the next three days his condition improved somewhat and the melæna diminished.

On March 2nd he was sent to the West London Hospital with a diagnosis of "bleeding duodenal ulcer." On admission he was given a blood transfusion—(14 oz., group 4). The next day he had much melæna. He was treated by rectal salines, followed by Lenhart's diet. During convalescence the patient complained of blurred vision in the right eye. Mr. H. P. Gibb reported: "both

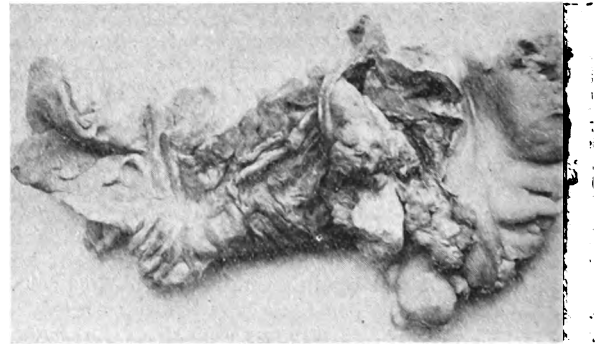


FIG. 1.—The duodenum opened to show the tumour in its posterior wall, adherent to the pancreas.

discs have blurred margins—there is a large oval hæmorrhage over the right macula, and a smaller hæmorrhage on the nasal side of the right disc. In both fundi there are spots of choroidal disturbances, which may be the result of hæmorrhages which have cleared up." A barium meal showed a hypertonic stomach. The duodenal cap would not fill, and there appeared to be a small crater where the duodenal cap is usually situated. The evidence was suggestive of duodenal ulcer.

Blood counts.—In March a blood count showed: red cells, 1,400,000; hæmoglobin, 23 per cent.; colour-index, 0.82; white cells, 8000; marked polychromasia, with poikilocytosis and anisocytosis; nucleated red cells rare. The patient was given ferri et ammon. cit., grs. 40 t.d.s., and a blood count on May 4th showed: red cells,

4,000,000; hæmoglobin, 76 per cent.; colour-index, 0.95; white cells, 8000.

Course of illness.—Discharged in July, 1934, he was seen again later that month when his teeth were removed as a possible focus of infection. Between July and October he had no trouble whatever; he gained about $\frac{1}{2}$ st. in weight, and stated that he had never felt better in his life. But on Oct. 23rd, and until the end of the year, he complained of vague abdominal pain, which he described as "indigestion." This pain was relieved by alkalis. From the findings at the previous X ray examination the

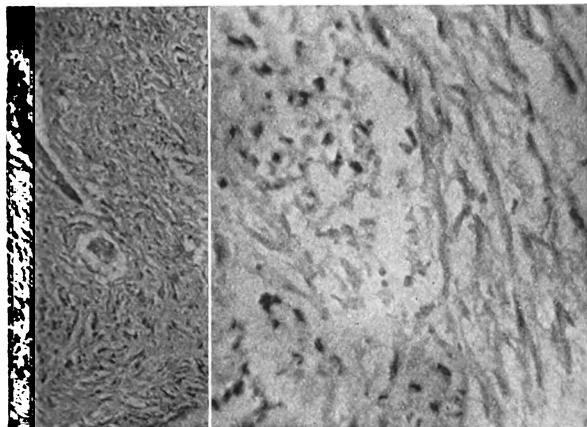


FIG. 2.—Microscopical sections of tumour: low power and high power.

possibility of a small duodenal ulcer was still kept in mind, and early in November he was given Larostidin injections, 5c.cm. daily, for three weeks. Between January and March, 1935, his symptoms gradually abated. On March 8th he was seen again in a state of collapse, and his condition exactly resembled his first attack. He was again removed to the West London Hospital. On this occasion his hæmoglobin was 24 per cent., but it rose to 42 per cent. with a month's intensive iron treatment. A barium meal showed irregularity and irritability of the duodenal cap. The patient remained in hospital until May, when he was discharged owing to his developing a mild attack of scarlet fever. On discharge he was advised to return later for laparotomy. From May until August he was free of symptoms, but on August 14th he collapsed while walking in the street and was brought home. His condition was again similar to his previous one, and he was admitted to the Royal Hospital, Richmond. Here he was found to be extremely collapsed and suffering from shock and internal hæmorrhage. Nothing could be found on palpation of the abdomen. A blood transfusion was advised, and while preparations were being made the patient died.

Post-mortem examination revealed the body of a fairly well-nourished man. The heart and lungs were normal. The liver contained no secondary deposits. As will be seen from Fig. 1, there was a tumour the size of a small hen's egg at the junction of the first and second parts of the duodenum, adherent to the pancreas. The tumour was in the posterior wall of the duodenum and had ulcerated through the lumen. The mucosa was congested and red, and the bowel full of blood. No metastases or glands could be found. Microscopically, Dr. David Murray reported the tumour to be a spindle-celled sarcoma (Fig. 2).

This case is interesting in view of the temporary recoveries and the excellent condition of the patient between the attacks. Clinically the outstanding feature was hæmorrhage, and there was no vomiting or evidence of obstruction. No positive evidence of a duodenal lesion was obtained and the patient was well nourished at the time of decease.

We are indebted to Dr. Geoffrey Konstam for the notes of the case while at the West London Hospital.

(References at foot of next column)

SPONTANEOUS FRACTURE IN ACUTE AND SUBACUTE OSTEOMYELITIS

REPORT OF TWO CASES

BY R. C. TATHAM, F.R.C.S. Eng.

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FRACTURE is a recognised though uncommon complication of chronic osteomyelitis, usually due to excessive removal of bone for cure of a chronic abscess or in sequestrectomy. But fracture in acute or subacute cases is exceedingly rare. Thus Capener and Pierce¹ in a series of 1086 cases of osteomyelitis found it in 18 (1.7 per cent.) and of these only 2 cases were classified as subacute and 1 as acute. The following cases therefore seem worthy of record.

CASE 1.—A boy, aged 14, was admitted to the Middlesex Hospital under the care of Mr. Pearce Gould on Oct. 30th, 1931, with a history of having eight weeks previously developed a painful swelling of the lower end of the left thigh and knee, thought at first to be tuberculous. After a few days a popliteal abscess had been opened and drained, and the pus from it showed staphylococci. There was no definite history of injury. On admission there was a wound on the inner side of the left thigh just above the knee discharging much pus; the knee was slightly flexed and there was varus deformity with great pain on attempted movement. The general condition was good and the temperature and pulse normal. Radiography (Fig. 1) showed a fracture through the metaphyseal region with impaction and angulation, and a general patchy rarefaction of the whole of the lower end of the shaft. Some periosteal new bone was visible proximal to the line of fracture. The deformity was corrected under general anaesthesia and the limb put in plaster with a window. The patient was returned to his local hospital on Nov. 26th, 1931. A letter from his doctor dated Oct. 3rd, 1935, stated that he was at work in a garage; no operation had been performed since leaving Middlesex Hospital, but a sinus was still present though repeated X ray examinations failed to show any sequestrum.

CASE 2.—A boy, aged 9, was admitted to Dudley-road Hospital, Birmingham, on June 6th, 1935, under the care of Mr. Parsons, with an acute painful swelling of the lower end of the left thigh of four days' duration. There was a history of mild injury while at school the day before the onset, but it was not sufficiently severe to prevent him running about at play afterwards. On admission (five days later) the pulse-rate was 106 and temperature 102.2° F. A popliteal abscess was opened and drained and the limb put up on a back splint with foot-piece and side splints. The lower half of the thigh remained extremely tender for the first week, but the local and general condition gradually improved, the temperature becoming normal on the eighteenth day after admission. X ray examination (Fig. 2) on the eleventh day showed a fracture with slight displacement through the metaphysis of the lower end of the femur, general patchy rarefaction of this region, and some periosteal new bone, most conspicuous on the inner

¹ Capener, N., and Pierce, K. C.: Jour. Bone and Joint Surg., 1932, xiv., 501.

(Continued from previous column)

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and popliteal surfaces. The wound continued to discharge, and on Sept. 27th a further radiogram (Fig. 3) showed a sequestrum, which on removal proved to be a portion of the cortex, the lower end being just above the line of fracture which was no longer visible. There was a massive involucrum.

In neither of these cases was there a history suggesting that fracture preceded the infection. In the first case fracture was noted eight weeks

then absorption is, of necessity, osteoclytic and slow, the bone being a dead structure. Further reference to the above cases will show that they were both of the less acute type, the first being at first regarded as tuberculous, and that the fracture occurred through a widespread area of rarefaction in the metaphyseal region. There is also a noticeable lack of new bone-formation in the region of the fractures (Figs. 1 and 2). Furthermore the after-histories show that sequestrum-

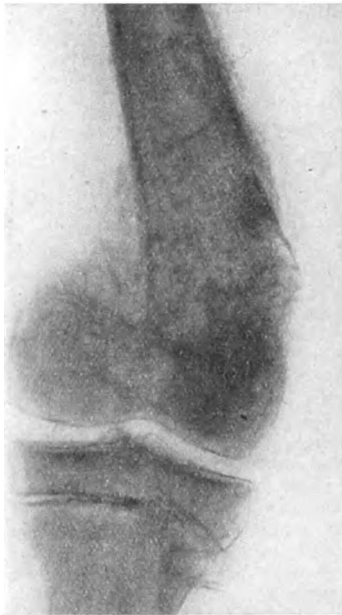


FIG. 1 (Case 1).—Radiogram of lower end of femur showing fracture through a diffusely rarefied area in the region of the metaphysis. Periosteal reaction slight and not related to fracture.

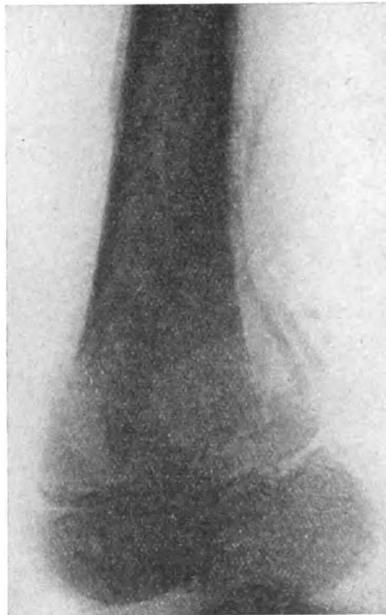


FIG. 2 (Case 2).—Radiogram of lower end of femur showing fracture with very little displacement through metaphyseal region. Slight but definite rarefaction. Some periosteal new bone posteriorly.

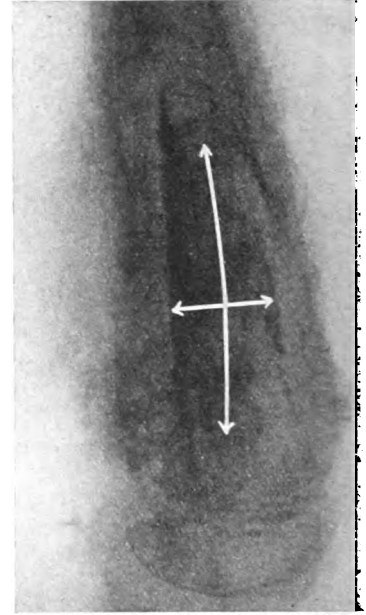


FIG. 3 (Case 2).—Radiogram of lower end of femur showing sequestrum (indicated by white lines) lying in a massive involucrum. Line of fracture not visible.

after the onset of the disease and in the second case on the fifteenth day of the illness—i.e., earlier than in any other recorded case. In both cases back splints had been applied after the initial drainage, which did not involve the removal of any bone. The exciting trauma must therefore have occurred while the limb was on the splint or after the splint had been removed for a dressing. There was no note of any knock or sudden bend, so that it must have been very trivial. In Capener and Pierce's earliest case fracture occurred at the junction of the middle and lower thirds of the femur eight weeks after drainage, and was due to a blow on the uncovered but supported thigh; the medulla had been drained. In the cases here recorded no bone had been removed for drainage.

When osteomyelitis follows its usual course there is simultaneous weakening of bone from vascular and osteoclytic absorption, and strengthening of it from periosteal new bone-formation; so that by the time the original bone has been absorbed sufficiently to allow of fracture enough new bone has been formed to prevent such an accident. If the rate of absorption outstrips that of new bone-formation, and if the absorption proceeds throughout the thickness of the shaft, then fracture becomes possible. The conditions necessary for rapid absorption are a high proportion of vascular tissue to bone and patent vessels. Such conditions are found in the metaphysis and in the more subacute type of case. Should all the vessels become thrombosed by the acuteness of the process,

formation was minimal and in Case 2 not immediately related to the fracture. Thus the clinical and X ray findings and after-histories support the explanation of causation which has been given.

My thanks are due to Mr. Pearce Gould, surgeon to Middlesex Hospital, and to Dr. F. W. Ellis, medical superintendent, and Mr. K. O. Parsons, surgeon to Dudley-road Hospital, for permission to publish the cases.

TWO CASES OF TWIN-LOCKING

By J. STANLEY COLEMAN, M.B. Lond.

LATE DEPUTY MEDICAL SUPERINTENDENT, FOREST GATE HOSPITAL, LONDON, E.

APART from certain features of interest, the rarity of this obstetric complication would be sufficient reason for placing these cases on record. According to von Braun¹ the condition occurred only once in 90,000 deliveries in Vienna.

CASE 1.—Mrs. A., aged 29, a 2-gravida, was admitted to the Forest Gate Hospital at 6.30 A.M. on Nov. 21st, 1934. Labour had commenced about an hour earlier with a sharp vaginal hemorrhage, on account of which she was sent into hospital. The last menstrual period began on March 1st, so that the pregnancy had advanced to about the thirty-eighth week.

Vaginal examination revealed an os that admitted two fingers, the cervical canal had not been taken up, and no placenta could be palpated around the margin of the os. A presenting vertex lightly engaged at the brim could

¹ Eden and Holland's Manual of Midwifery, London, 1925, p. 358.

be palpated with the fingers through the unruptured membranes. The pelvis was judged to be roomy, and on inquiry the patient told me her first infant weighed 12 lb. at birth, and the labour was quite normal. Abdominal examination was difficult owing to frequent strong contractions; over-distension of the uterus was noted but hydramnios was not present. Only one fetal heart could be heard all over the lower abdomen and only one breech palpated with certainty at the fundus. Between pains, however, I thought I could palpate a second head slightly to the left of the midline at the lower pole of the uterus. A tentative diagnosis of twins was made, both fetuses presenting by the vertex. A catheter specimen of urine showed a cloud of albumin.

Labour was allowed to proceed and twelve hours later vaginal examination revealed the os three-quarters dilated, the cervix thick all round with some oedema of the anterior lip. A fetal head was half engaged at the brim, extended, and lying in the left occipito-posterior position. Morphia and later chloral were administered and the patient obtained a little respite from the pains that continued strong and frequent. Fifteen hours later examination revealed no further advance and the woman was becoming exhausted. The abdomen was now very tender and any movement or palpation distressed the patient considerably.

At 9.30 A.M. on Nov. 22nd, 28½ hours after the onset of labour, chloroform was administered and a careful pelvic examination made. I found two heads firmly impacted at the brim. The foremost head was lying face to pubes in the extended position and a loop of cord was felt around the neck. The second head was firmly wedged under the chin, against the neck and upper part of the thorax of the first fetus. The back of the second fetus was in the midline anteriorly.

The cervix was first gently dilated to its maximum, the second head pushed up out of the brim, and the first head completely rotated and flexed as much as possible. I always use my left hand for the manoeuvre of manual rotation, so that I was able to apply the forceps without removing my hand from the uterus. The first head was gently drawn down to the vulva and delivered after removing the forceps, and it was soon found to be quite impossible to deliver the trunk, owing to the extreme tension on the cord and the loop drawn tightly around the neck which could not be slipped over the head. The cord was divided between forceps and the first fetus, a live female weighing 5 lb. 12½ oz., rapidly delivered. Sharp intrapartum hæmorrhage now occurred so I applied the forceps to the second head and delivered another live female weighing 5 lb. 13½ oz. ten minutes later. There was some post-partum hæmorrhage which was checked by rapidly expressing both placentæ from the uterus.

The case was one of binovular twins with two separate placentæ (one of the battledore variety) and no membranous fusion. The puerperium was uneventful and the patient left hospital with the vigorous twins twelve days later.

I would draw attention to the following points: (1) The difficulty of establishing firmly the diagnosis of twins without X ray examination. In my experience the diagnosis is often missed. (2) The frequency with which loops of cord around the fetal neck cause primary extension of the head leading to complications such as persistent occipito-posterior positions, "face" and "brow" labours and prolapse of an arm. In this case extension of the leading head allowed the second head to become impacted under the chin. (3) Intrapartum hæmorrhage after delivery of the first twin should be an indication for immediate delivery of the second fetus.

CASE 2.—Mrs. B., aged 27, a primipara, was admitted to the hospital on Nov. 16th, 1934, as a case of albuminuria of pregnancy. There was oedema of the legs and vulva and some puffiness of the face. The blood pressure was raised to 160/100 mm. of mercury, and the urine loaded with albumin. Some degree of hydramnios was noted and apart from the discomfort of the distended abdomen there were no symptoms. A diagnosis of twins had already been made and verified by X ray examination. The last

menstrual period began on March 3rd, so that on admission the pregnancy had advanced to about 37 weeks and the expected day of confinement calculated in the first half of December. The pelvis was judged to be roomy; external pelvimetry revealed normal measurements, and on vaginal examination nothing abnormal was noted.

With rest in bed, special diet, and mild eliminative treatment on classical lines, the general condition improved, the oedema completely disappeared, and the albuminuria diminished. The membranes ruptured suddenly on Dec. 5th at 10.30 P.M. and the patient went into labour. She was examined at 11.30 P.M., the os admitted two fingers, the cervix was not taken up, and a head was lightly engaged at the brim. The second vertex could easily be palpated per abdomen in the midline anteriorly. By 6 A.M. the first head was well engaged, the dilatation very slow (three fingers), and it was noted the vertex was extended and lying almost face to pubes. At 1.30 P.M. on Dec. 6th, 15 hours later, the os was fully dilated, the extended head was found impacted low in mid-cavity, lying face to pubes with marked moulding, the parietals overlapping the displaced frontal bones, and a large caput over the anterior portion of the left frontal bone. The pains were strong and frequent and with the thought that the fetus was probably not very big the patient was left for spontaneous delivery to occur.

By 4 P.M. it was manifest that the obstruction was more serious. The anus and vulva were oedematous, the patient much distressed, and the lower abdomen tender on palpation. There had been no advance at all and interference was obviously indicated. A general anæsthetic was administered and a careful pelvic exploration revealed the extension of the leading head to be due to a hand being doubled under the chin. The second fetal head was found entering the pelvic brim along with the lower part of the neck and upper part of the thorax of the first fetus. The back of the second fetus was in the midline anteriorly.

The second fetal head was pushed up and to one side, the leading head completely rotated and flexed as much as possible after dislodging the hand from under the chin. The whole manoeuvre was carried out with the left hand, so that the forceps could be applied without removing my hand from the uterus. The leading vertex was drawn down to the vulva and owing to the distorted (somewhat quadrilateral) shape of the head, bursting of the oedematous perineum seemed inevitable. Right lateral episiotomy was at once performed and the head quickly delivered. The birth of the first infant, a living male, weight 5 lb. 8½ oz., was followed by a sharp intrapartum hæmorrhage. The second bag of membranes was ruptured digitally and the forceps applied to the second head, which was gently drawn down to the vulva, and the delivery of the second living male infant, weight 6 lb. 14½ oz., effected. There was a fair amount of post-partum hæmorrhage, which ceased when the massive placentæ were expelled from the uterus eight minutes later. The episiotomy incision was accurately sutured with silkworm gut.

The placentæ exhibited partial fusion along their margin of contact for a distance of 4 in. by strong bands of connective tissue and placental substance. No large vessel passed over the fetal aspect of the line of fusion, all the main vessels terminating in each placenta some distance from the fused margins. There were two complete chorionic and amniotic sacs, but along the area of contact the two chorionic membranes had become loosely applied to each other, but could be separated easily by gentle traction. One of the placentæ was of the battledore variety. I regard the case therefore as one of binovular twins.

(1) In this second case the primary extension of the head appeared to be due to a hand and arm being impacted under the chin. This I have found to be a frequent complication in difficult deliveries due to extension and malrotation of the fetal head. (2) In both these cases the anæsthesia and manipulations were carried out with the patient in the left lateral position. By using the left hand to carry out the manoeuvre of rotation of the head the application

of the forceps is greatly facilitated and intra-uterine manipulation reduced to a minimum. (3) When the condition of twin-locking is suspected it is infinitely preferable to interfere early rather than to wait for the impaction to become very severe, when a destructive operation on the leading head would become necessary.

THE INHALATION OF COMMON PINS

BY J. MCFARLAND, M.D. Liverp., F.R.C.S. Edin.,
D.L.O.

ASSISTANT THROAT SURGEON TO THE ROYAL LIVERPOOL CHILDREN'S
HOSPITAL AND ALDER HEY HOSPITAL, LIVERPOOL

THE following case may interest bronchoscopists, especially as it raises debatable questions.

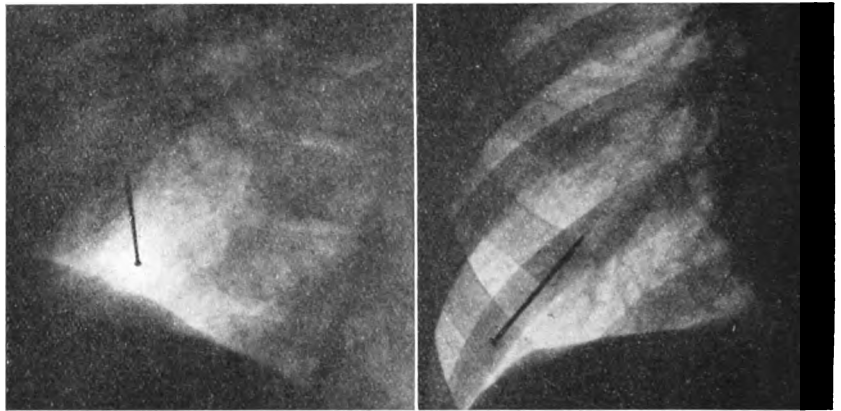
On Oct. 7th, 1934, a boy aged 13 inhaled a common pin, and a radiogram showed it lying head-downwards in a posterior bronchiole of the right lower lobe. The same day a bronchoscopy failed to discover the pin, nor could I see in the bronchial epithelium any evidence of the transit of a foreign body. No physical signs developed in the chest, and the only symptom was pain in the right hypochondrium, probably reflex in origin and due to irritation of the diaphragm. Several attempts were made to remove the pin under the fluoroscope, but without success, and after seven months there was no change except that the pin had moved downwards and outwards. The boy was quite well and but for a cough showed no physical signs. Apparently neither the pin nor the manoeuvres had affected him.

On May 8th, 1935, he coughed the pin into his mouth and brought it to hospital. It proved to be an ordinary common brass pin, tin-coated and about 1½ in. long. A small amount of mucopus adhered to it and there was a

little erosion of the tin coating. He has been quite well since.

In two other comparable cases the pin has remained in the lung for six and twelve months respectively, without causing any apparent pathological changes.

One is led to inquire about the state of the lung epithelium in contact with the foreign body during these seven months, and whether a pin could be coughed up without there being any infection present. It has been stated that sooner or later infection will supervene and that therefore every effort must be made to retrieve the foreign body. My own feeling, based on these three cases, is that where a foreign body of small cross-section passes to the utmost depths of the lung, it does not at first set up any dangerous processes. Unless the foreign body can be seen through the bronchoscope it is well to wait until low-grade infection has dilated the minute



Lateral and antero-posterior radiograms showing position of the pin.

passages, rather than risk injuring the tissues by seeking for it under the direction of an external observer.

I am indebted to my senior, Mr. P. Leathart, for permission to publish this case.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF NEUROLOGY

At a meeting of this section held on Jan. 16th the chair was taken by Prof. F. L. GOLLA, the president, and a paper on

The Spleen, the Liver, and the Brain

was read by Prof. B. BROUWER (Amsterdam). The relationship between these three organs, he said, could be viewed in a wider aspect since the introduction of the study of the so-called lipidoses. Since Kinnier Wilson had first described hepatocerebral degeneration, knowledge of the clinical syndrome had been extended, and it had been shown that the pathological changes might be widespread in the central nervous system. Various writers had reported families suffering from hepatocerebral degenerations in which some members had no lesions in the brain, and had suggested that the primary lesion should be sought in a damaged liver which produced or passed toxins having a special effect on the central nervous system. There were, however, still differences of opinion. Prof. Brouwer had, he said, had the

opportunity of studying three brothers suffering from this disease, with a classical clinical picture: extrapyramidal motor disturbances, brownish-yellow granular pigmentation of the cornea, the so-called ring of Kaiser-Fleischer, and mental symptoms. In two of them autopsy had shown hepatic cirrhosis, splenic enlargement, and symmetrical lesions of the corpus striatum. The neuroglia cells of Alzheimer had been seen. These lesions seemed typical of Wilson's disease, but there had also been a bilateral pathological change in the forebrain cortex: small cavities, increase of glia, and newly formed blood-vessels. The changes were chiefly in the frontal area, gradually diminishing towards the occiput, and strongly suggested a congenital inferiority.

The idea that the toxin in hepatocerebral degeneration was formed in the liver had been influenced by analogy with Kernikterus (icterus gravis neonatorum). In this condition there was usually erythroblastemia in the blood and liver and spleen. This was, however, secondary and not always present. It represented regeneration after destruction, the destruction having caused the icterus. The brain changes varied from case to case, but the globus pallidus and corpus subthalamicum were chiefly affected. Maternal

toxæmia had been proved to be the cause of this condition. In typical cases of Kernikterus the yellow coloration was not due to liver disease but to hæmolysis. The analogy with hepatocerebral degeneration was not, therefore, a sound one.

A case of hæmochromatosis had been studied by Prof. Brouwer's Institute. This rare condition was characterised by melanoderma, liver cirrhosis, and diabetes, and was almost confined to males. This patient, however, had also had disease of the brain: character changes, followed by confusion, restlessness, incontinence, and somnolence. After an attack the use of the hands and legs and speech had been impaired. He had also shown dysarthria, dysphagia, emotionalism, tremor in both arms, stiffness in the facial muscles, and hypotonia in limb muscles. There had been no pyramidal signs. At autopsy there had been the usual signs of hæmochromatosis, a typical Laennec cirrhosis, fibrosis of the spleen and pancreas, and the cerebral lesions of Wilson's disease. Two kinds of pigment were found in this condition: hæmosiderin and a brown melanin pigment derived from protein. At one time the diabetes and later the cirrhosis had been regarded as the primary factor; but Prof. Brouwer thought there was a disturbance of iron and protein metabolism, of unknown endogenous origin. The pathological changes were all coördinated with one another. Hæmochromatosis associated with pseudosclerosis was not Wilson's disease, but the two conditions could not be very different. Hepatocerebral degenerations probably belonged to that class of metabolic disturbances which were characterised by lesions in organs with congenitally poor resistance. The ætiological factor was unknown.

The question arose whether such disturbances could be limited to special organs. Relevant arguments were found in the "lipoidoses," the three principal ones being Schüller-Christian's disease, Gaucher's splenohepatomegaly, and Niemann-Pick's splenohepatomegaly. The first showed defects in the bones, especially of the skull and pelvis, and the cell deposit was cholesterol. In Gaucher's disease it was kersin and in Niemann-Pick's disease it was partly lecithin and partly phosphatide. Niemann-Pick's disease was associated with amaurotic idiocy and was characterised by the accumulation of an enormous quantity of large, pale cells filled with fine drops of lipid, the so-called foam cells, in liver, spleen, and other organs. There was a general disturbance of lipid metabolism. M. Bielschowsky had regarded amaurotic idiocy as a result of this disturbance. Prof. Brouwer described a case of typical amaurotic idiocy and the post-mortem findings, which supported Bielschowsky's view. The patient was a girl, aged 18 months, with classical symptoms: idiocy, commencing hypertonia of the extremities, and increase of the deep reflexes. In the macula the typical white area with central red spot was found on both sides. The child had had several epileptiform convulsions, developed contractures in the limbs, and died at the age of 2½. Autopsy revealed the typical findings; the nerve-cells of the cortex, basal ganglia, midbrain, pons, medulla, and spinal cord were all swollen and distended by lipid deposits. Myelinisation was retarded in all four lobes, in the cord, and in the thalamus, but almost normal in the hypothalamus, corpus striatum, and midbrain. Changes were very marked in the cerebellum; in many places the granule cell layer was considerably atrophied and there was increase of glia everywhere. It was obvious that normal

fibres might proceed from cells filled with lipid. The pathological changes were limited to the ectoderm, thus supporting Schaffer's theory that the fundamental process in amaurotic idiocy was a primary affection of the nerve-cells, but in the spleen of this case typical foam cells had been found, though without splenomegaly. During the last months of life the quantity of lecithin in the blood had increased in proportion to the cholesterol.

In conclusion, he said that all the diseases he had mentioned, except Kernikterus, were disturbances of metabolism, and such disturbances need not be general but might show a localisation in certain organs. It depended on the inborn factor which organ would suffer. Chemistry must take the lead in further researches on these subjects.

DISCUSSION

Dr. J. G. GREENFIELD asked where the poisons arose, and welcomed Prof. Brouwer's attention to the neglected corpus subthalamicum.—Prof. BROUWER replied that he thought the poison might be intestinal, but admitted as a research worker that he had seen several cases where the liver had been practically normal, and he did not really know.

Prof. A. MAYER thought that Prof. Brouwer's Kernikterus material might throw some light on the lesion of the globus pallidus appearing at or soon after birth described by Hallevorden and Spatz, and its identity with the status demyelinatus of C. and O. Vogt. He asked if there had been any evidence of birth trauma.—Prof. BROUWER replied that he was sure there was no birth trauma.

Dr. E. PARKES WEBER cited some cases of family cirrhosis where all the usual ætiological factors were absent; he thought such cases were a form of congenital developmental disease: inborn disease which either appeared at birth or was potential at birth and appeared later. Three diseases of this kind were associated with cirrhosis of the liver: Wilson's disease, hæmochromatosis, and generalised congenital developmental telangiectasia (Osler's disease). The most likely explanation of the cirrhosis in Wilson's disease was that it was a congenital developmental dysbiotrophy. Hæmochromatosis belonged to the same group as hæmatoporphyrinuria and alcaptonuria. Why Osler's disease showed cirrhosis was a puzzle, but it certainly did.—Prof. BROUWER observed that there were many cases of lipodystrophy without mental symptoms. He had no experience of Osler's disease.

Dr. GORDON HOLMES, proposing a vote of thanks, commented on the curious systematised susceptibility of parts of the nervous system and mentioned manganese and other poisonings. The primary agents must, he thought, be multiple.

TUBERCULOSIS ASSOCIATION

At a meeting of this association held at Manson House on Jan. 17th a discussion was opened by Dr. NOEL D. BARDSWELL on

After-care of the Tuberculous in London

The organisation of after-care in London differed, he said, from that elsewhere by reason of the enormous size of London and the unavoidable division of responsibility. Each of the London boroughs made its own arrangements, and in consequence considerable variation existed as to the character and scope of this provision. Although in the main London

was faithful to the voluntary principle, the care committees were tending more and more to become official bodies, with, e.g., a hitherto voluntary secretary replaced by a secretary employed and paid for by the borough. The Metropolitan Boroughs Standing Joint Committee had recently expressed the view that care committees should consist of eight borough councillors and seven other members representing voluntary charitable agencies operating in the borough. He doubted whether a care committee of this composition would prove as useful as one chiefly composed of individuals prepared to render personal service to particular patients. On the question whether a single officer or a committee was the better, he thought that when both were first-class there was probably little to choose, but he leaned to a committee with a good secretary, a committee having the advantage that it tapped more sources, spread responsibility, and had greater opportunity of raising funds in various ways. Care work, in the broadest sense of the term, was the determining factor in the future of most patients, but to be effective it must be continuous. There was often a hiatus of a year or more during a patient's stay in an institution. Much might happen in a home during this time. The services of a visiting almoner might prove a valuable link between the patient, his home, and those interested in his after-care. On the vexed question of funds for care committees the L.C.C., Dr. Bardswell said, had always taken the view that a financially aided care committee would merely be an additional relief agency, but although in principle he thought this was a sound view, assistance to be effective must sometimes be immediate, and a care committee should have command of a small fund—preferably raised by themselves—for this emergency work.

PULMONARY CASES

Not the least important extension of after-care facilities had been the establishment of the industrial settlements at Papworth and Preston Hall, but such settlements though valuable were of course no solution of the after-care problem, since only some 4 per cent. of the patients admitted proved suitable colonists. Work centres run on commercial lines had obvious limitations, but were useful within these limits; while the handicraft classes now to be found in 15 boroughs were one of the most pleasing features of after-care work in London. Woolwich and Deptford had gone further, and had instituted cookery classes for women patients and the mothers and wives of patients. Another growing and effective factor in after-care was the L.C.C.'s policy of rehousing overcrowded households which contained a case of active tuberculosis. During last year 33.5 per cent. of the households recommended for removal by the public health department at County Hall secured new accommodation. The principle of letting houses on a new estate to a tuberculous family was not universally approved. Recently he had addressed a conference on this subject at Oxford and was surprised at the amount of opposition aroused by the proposal, experienced public health workers in the county expressing horror at the suggestion that their nice new municipal cottages should be contaminated by the tuberculous.

Dr. Bardswell concluded with a brief review of the L.C.C.'s scheme for the boarding-out of children from an infected home, or to allow of a mother going away for treatment. On the average 150 children were away at any one time, 25 per cent. to remove them from risk of infection and 75 per cent. to allow

of a patient going to an institution. Other directions in which public authorities had in late years eased the burdens of care committees were by the provision of extra nourishment, of dentures, of beds and bedding, and clothes. Finally, he suggested that A.P. refills, even if no longer clinically effective, were an aid in after-care, inasmuch as they kept a patient in constant touch with skilled knowledge of tuberculosis—a most valuable thing.

SURGICAL TUBERCULOSIS

Dr. J. G. JOHNSTONE (Princess Mary's Hospital for Children, Margate), who followed, confined himself mainly to after-care in children who had suffered from tuberculous disease of bones and joints. It was generally agreed that at the present day a well-organised follow-up system in connexion with surgical tuberculosis was essential for several reasons: (1) Tuberculosis was a generalised infection which manifested itself in active processes at one or more sites, and, having been quiescent, might light up again at any time in the old lesion or elsewhere. (2) Recrudescence in the early stages generally arose insidiously, unknown to the patient, requiring a practised clinician to recognise its occurrence. (3) Arrest of the disease in the case of tuberculous bones and joints did not mean the final end-result. With the arrest of the disease, few cases retained full range of function in the affected part. Partial immobilisation and "posturisation" had to be maintained over a long period to prevent a recurrence of activity and to maintain the optimum position of the area relative to the rest of the body. Between 66 and 75 per cent. of cases of tuberculous arthritis resulted in osseo-fibrous ankylosis which, in the case of children, took several years to become organised and consolidated after quiescence. (4) To maintain the optimum position with relative immobilisation and relief from pressure or friction, some firm mechanical apparatus had to be worn, and this necessitated supervision, repair, and often renewal—depending on the site of disease, age of patient, and other factors—the appliances being eventually gradually discarded at the appropriate time. (5) Tuberculous disease of spine and hip might result in permanent disability from deformity or shortening, necessitating the constant provision of a spinal support or surgical boots. Such conditions left untreated resulted in chronic spinal arthritis in middle life from mere anatomical malalignment. (6) It was frequently necessary to contemplate surgical interference at some future date, and the choice of the proper time should be left entirely in the hands of the surgeon who had had charge of the patient during the active stages of the disease.

It was of vital importance, he said, that effective surgical after-care should be carried out by the surgeon undertaking the in-patient treatment, to ensure continuity in the programme of treatment extended over a period of years. Moreover, his experience at several hospitals working along different lines had taught him that effective supervision in the after-care resulted in cases being admitted at an earlier stage in reactivation, with minor deformities. It was noticeable that cases which came from areas with effective after-care organisation were in better condition than those from areas where arrangements were of an indifferent character. A very comprehensive system of after-care had been developed by the L.C.C. in connexion with cases of surgical tuberculosis—no small achievement in a city like London. Consideration of the after-care began

almost as soon as the patient reached hospital, when an environmental report was received. Notice was taken of the home conditions, and allowance was made in the ambulant period at the hospital before the case was recommended for discharge. The speaker described in detail the procedure followed in three groups of cases: (a) those discharged to their own homes within the administrative area of the L.C.C.; (b) those discharged to convalescent homes or other institutions; (c) those discharged to other areas outside the administrative area of the L.C.C. Ninety-five per cent. of the cases of tuberculous disease of bones and joints discharged to London from Princess Mary's Hospital, Margate, were supervised in their after-care from the central hospital. This after-care clinic was held at the County Hall every Monday. In spite of the steady increase in the attendance roll, there had been no increase in the incidence of reactivation, and there had been a reduction in the development of gross deformities requiring correction. The position was remarkable when compared with the state of affairs only a decade ago, when the percentage of readmissions was high and the disease and deformity well established. Though the after-care clinic entailed considerable time, trouble, and labour, it had proved well worth while. Any orthopaedic hospital failing to have a well organised and conducted follow-up scheme was, in his opinion, accomplishing only half its function to the community which it served.

Vocational training, Dr. Johnstone added, was a sound economic and preventive proposition, and he would like to see it extended to a greater number of cases. This country had not yet reached the American standard in the rehabilitation of the cripple into industry, but there were great possibilities.

LIVERPOOL MEDICAL INSTITUTION

At a meeting of this institution, held on Jan. 9th, with Dr. C. O. STALLYBRASS, the president, in the chair, a paper entitled

Some Aspects of Bronchial Carcinoma

was read by Dr. E. T. BAKER-BATES. After pointing out that this disease is recognised more often than it was 25 years ago, he gave reasons for doubting whether there has been a comparable increase in its incidence. The first symptoms, he said, might be hæmoptysis, paroxysmal dyspnoea, or those of pleural effusion or localised pulmonary infection, and in the early case there might be no physical signs. In diagnosis the position of the heart and trachea were of greatest significance. With collapse of the lung, which followed stenosis of a main bronchus, they were displaced towards the affected side—a most suggestive finding. Later, dullness on percussion, diminished breath sounds, and reduction in the hemidiaphragmatic movements were the commonest signs. Radiography might show nothing if the growth was confined to the lumen of the bronchus or if it was retrocardiac. Again the shadows cast by collapse of the lung and the suppuration following bronchial obstruction might obscure the picture. Lipiodol was useful in the early diagnosis and in pleural effusion after air-replacement. It indicated the upper margin of the growth and showed the extent of the intra-bronchial growth (rat-tailed bronchus). The outline of the growth was nearly always convex; fusiform narrowing was probably due to chronic inflammatory changes. Dr. Baker-Bates had never seen any dele-

terious effects due to the lipiodol. The value of bronchoscopy in the early diagnosis and treatment could not, he thought, be over-estimated. The technique had now been mastered sufficiently to permit of its being performed with ease and without discomfort to the patient under local anaesthesia, and it added a certainty to the diagnosis which could not be obtained in any other way, by giving information as to the site and extent of the lesion, and enabling tissue to be removed for section. If any successful treatment could be evolved, its success depended on early diagnosis; one should therefore be prepared to investigate with the bronchoscope all patients presenting any of the recognised manifestations of the disease. Patients with advanced bronchial carcinoma suffered from the mechanical effects of a blocked bronchus, and the introduction of radon seeds which would keep the lumen patent made their lives far more bearable by allowing bronchoscopic drainage and preventing suppurative complications. The duration of the disease depended upon whether the patient had a patent bronchus or not. If the bronchus was occluded the course was rapid, death occurring from inflammatory changes in the "drowned lung" which formed a suitable nidus for pneumonic consolidation and abscess formation. When the growth remained extrapulmonary the progress was slow, and the patient might live in comparative comfort for a couple of years. Deep X ray therapy often gave relief, especially where there were large mediastinal glands producing mediastinal obstruction, but it did not seem to influence the primary growth in the bronchus.

Dr. A. ADAMS said that since the foundation of the tuberculosis service, patients suffering from pulmonary diseases had been coming more and more to the tuberculosis officer for diagnosis, and the voluntary hospital now rarely saw them. This was well illustrated in the figures published by the department in Manchester, where in 1932 there were 138 deaths from cancer of the respiratory system and a record of 89 cases of pulmonary carcinoma given, almost all of bronchial origin. The Manchester area appeared to be the most fertile source of this disease in the kingdom, thus approximating to the mining districts of Czechoslovakia and Saxony. Severe hæmorrhage was a rare complication, but staining of the sputum occurred in about 40 per cent. of cases at some period. The symptoms and physical signs found in the chest were usually caused by occlusion of a bronchus or by pressure. Metastases in the central nervous system were commoner than the published reports suggested. The type of disease described by continental physicians as lymphangitis carcinomatosa had been missed by many clinicians, the X ray appearance being misread as miliary tuberculosis. The recent work of Dudgeon and Wrigley, showing how groups of malignant cells in the sputum could be rapidly recognised, was a valuable addition to the clinical examination. Lipiodol for demonstrating the presence of a growth should be used with great care as it might prevent a patient later being submitted to deep therapy treatment, and was usually not necessary for diagnosis.

Prof. HENRY COHEN emphasised that nearly a quarter of all cases had an acute pneumonic or pleuritic onset. Rarely the radiological features of miliary tuberculosis were so closely simulated by carcinoma that only by post-mortem examination could a diagnosis be established. Nearly 10 per cent. of all cases had a positive Wassermann reaction, though pathological examination proved the lesion to be

malignant; and the association of tuberculosis with malignancy was by no means infrequent. "Unresolved pneumonia" was a seductive though dangerous term, and whilst the radiologist might be justified in using it, the physician should recognise the possibility of an underlying carcinoma in all such cases. A special technique might reveal the presence of malignant cells in the sputum, though a negative finding was of no value. Three of the cases of proved bronchial carcinoma under Prof. Cohen's care had had as their presenting symptom intense lumbar pain, although there was no radiological evidence of metastasis; later the pain radiated up the spine to the neck. The possibility of metastases giving no radiological signs of their presence was offered as an explanation, though no opportunity for confirmation by the post-mortem examination had been afforded in these cases. The superior pulmonary sulcus tumour, described by Pancoast, was usually a bronchogenic carcinoma at the pulmonary apex. He had seen many cases of generalised metastases from a primary carcinoma of the bronchus so small that there was neither clinical nor radiological evidence of its presence during life. All the patients he had referred to surgeons had died within twelve months of operation—with one exception, that of a man with a pedunculated carcinoma removed from the right main bronchus, who was alive and well two years later. Both X ray treatment and radium had given very disappointing results.

Mr. H. V. FORSTER recalled Yankauer's suggestion that in all cases of hæmoptysis in which no tubercle bacilli could be found bronchoscopy should be carried out, and that the endoscopist should encourage the physician to look upon this useful direct method as one not carrying a great risk. As Dr. Baker-Bates had pointed out, the endoscopist could help to relieve pulmonary collapse due to bronchial narrowing, and he himself had been able once to remove to a considerable extent with punch forceps a growth involving the left main bronchus with restoration of ventilation. The question whether deep X ray therapy could be helpful seemed to have been answered favourably by many observers in America. Some patients had experienced relief for as long as five years.

Dr. P. H. WHITAKER emphasised the importance of screen examination in cases of early bronchial carcinoma. It was often possible to detect deficient air-entry before it became clinically apparent by noting limitation of diaphragmatic movement on the affected side. The obstacles to efficient irradiation were difficulty of access and the fact that a large enough dose could not be at present directed on to the tumour. This accounted for the poor results.

Dr. HOWELL HUGHES said that from a surgical point of view there were four main types of bronchial carcinoma; being classified according to radiographical and bronchoscopic findings. (1) Intrabronchial carcinoma, in which the early radiographical appearance was a slight increase in the shadow of one hilum, and later, with bronchial obstruction, a dense wedge-shaped shadow spreading from hilum to periphery. (2) Mediastinal, which spread from a large bronchus into the mediastinum, but not peripherally, giving increase of the mediastinal shadow. (3) Peripheral, which spread outwards, and might invade the chest wall, while mediastinal glands were not involved. Radiographically an almost rounded shadow was seen in the lung, making contact with the hilum. Pancoast's tumour described by Dr. Baker-Bates was probably of this type, and merely because of its position and size caused the complications described,

and so did not justify a separate group. (4) Parenchymal, which radiographically showed a rounded shadow in the lung distinct from the hilum, with late glandular involvement. In types 3 and 4 lobectomy or pneumonectomy might bring about cure, but in type 1 the most that could be done was to relieve obstruction by means of radon seeds.

Mr. COSBIE ROSS read a paper on Lipiodol in Surgery of the Biliary Passages.

NEW INVENTIONS

APPARATUS FOR CONTINUOUS ADMINISTRATION OF SALINE SOLUTION

THE accompanying drawing shows an apparatus I have designed for giving continuous drip intravenous saline, for use with Crookes's bottles of gum or glucose saline.

It consists of two corks to fit the bottles, each provided with a long and a short tube. When the bottle is inverted, saline runs out of the short tube, while the long tube allows air to flow in, thus preventing a vacuum forming. The short tubes are connected to a Y-piece, below which is an adjustable clamp and a glass visible-drip connexion. From here the saline runs down through a metal U-tube in a thermos flask, where it is heated to the required temperature before it reaches the vein. The whole apparatus is on a stand which places it at the right height above the bed.

The tubes and corks can be removed en bloc from the stand, boiled in a steriliser, and fitted to the bottles. Boiling water is put in the thermos, and the apparatus is ready for use. The two bottles are emptied alternately, the empty one being clamped off and changed for a full one; thus the administration of saline may be kept up for as long as is required.

The apparatus has proved very satisfactory in use, its advantages being that it is easy to sterilise (the contents of the bottles being already sterile), that it never runs out, and that the saline is administered hot. If necessary it can be used to administer saline rapidly instead of by the drip method, simply by unscrewing the adjustable clamp above the visible drip connexion.

It has been made for me by Jack Storey, Station-road, Ashford, Middlesex.

C. E. WATSON, M.R.C.S.,
House Surgeon, King Edward VIII
Hospital, Windsor.

ROYAL SANITARY INSTITUTE.—Mr. John Wilson, chief architect to the department of health for Scotland, will open a discussion on the sanitation and planning of flats at a meeting to be held at the institute (90, Buckingham Palace-road, London, S.W.) on Tuesday, Feb. 11th, at 5.30 p.m.

REVIEWS AND NOTICES OF BOOKS

A Text-book of Fractures and Dislocations

Third edition. By KELLOGG SPEED, S.B., M.D., F.A.C.S., Professor of Clinical Surgery, Rush Medical College of the University of Chicago. London: Henry Kimpton. 1935. Pp. 1000. 50s.

THIS book presents an exhaustive account of the subject of fractures and dislocations; for example, three and a half pages are devoted to fractures of the laryngeal cartilages. The pathology and mechanism of each fracture is dealt with at some length, and as the unusual types of fracture receive considerable attention, the importance of the work to the practising surgeon is obvious. Different methods of treatment of each fracture are considered and compared—e.g., every type of suture material and every incision used in repair of fracture of the patella is described. The author mentions in the preface that he has been at pains to avoid fads; but from the point of view of the surgeon faced with the immediate treatment of a case, a definite description of the method employed by the author, and evolved by his own experience, would have been helpful. The references in the text and at the end of each chapter to the work and writings of various surgeons should be of great use to the research student.

An individual feature of the book is the method of illustration by line drawings which are tracings from original radiograms. These are well drawn and are most convincing. It is interesting to find that in applying suspension traction for fractures of the femur, the author uses the body-weight of the patient as the extending force, and does not apply weights to the limb. This method, an excellent one in practice, seems to be too little used. Its great advantage is that it allows considerable mobility of the patient, and of the limb as a whole, without upsetting the line of traction or the finely adjusted suspension of the splint. All weights suspending the splint hang at the head of the bed, well out of the way. The section on operative treatment contains an excellent account of the methods of application of skeletal traction, with instructions for avoiding its two main dangers—infection and over-extension. There seems to be some ambiguity in the description of the angle of flexion advised in the treatment of supracondylar fracture of the humerus. An angle "never more than 60," and flexion "as far as possible" are mentioned in the same paragraph (p. 374). Full supination is recommended for this fracture, a position which Böhler and others have condemned on very definite grounds.

We can congratulate author and publishers on a work which is well-produced, clear and precise, and pleasant to read.

Die Differentialdiagnose chirurgischer Erkrankungen

By W. BRAEUCKER, Hamburg; H. F. O. HABERLAND, Köln; H. KLOSE, Danzig; and M. ZUR VERTH, Hamburg. Edited by H. F. O. Haberland. Berlin: Walter de Gruyter and Co. 1935. Pp. 1180. R.M.52.

THIS large book on surgical diagnosis is intended, the authors affirm, for students and practitioners. It may well prove to be too large a work to appeal to undergraduates, but on the other hand many surgeons will wish to possess it as a work of reference. It is well and simply written and easy to read, and deals systematically with the diagnosis of surgical

diseases of all parts of the body. The illustrations, over 450 in number and of high quality, include not only photographs of surgical affections but radiograms of diagnostic interest and very useful diagrams of methods of examination. The section dealing with the nervous system is particularly valuable in this connexion. An attractive and rather unusual feature of the book is the short epitome of treatment which follows the account of each disease.

The work is a creditable compilation of present-day surgical diagnosis.

Practical Zoology

By H. R. HEWER, A.R.C.S., D.I.C., M.Sc. Lond., F.L.S., Lecturer in Zoology, Imperial College of Science and Technology. London: Hutchinson's Scientific and Technical Publications. 1935. Pp. 118. 5s.

THIS book contains a set of detailed instructions for observation and dissection of the usual type-specimens used in an elementary course of zoology, together with an account of methods of fixation, preservation, section cutting, and mounting of specimens. There is nothing particularly original in the subject matter nor in the manner in which it is presented. Those, however, who are about to teach elementary zoology in universities or schools will do well to refresh their memories by a study of its pages and may find that it fits their ideas closely enough to enable them to base their course on it. To students working on their own this book should prove extremely useful.

1. Elementary Morphology and Physiology for Medical Students

Second edition. By J. H. WOODGER, D.Sc., Reader in Biology in the University of London. London: Humphrey Milford, Oxford University Press. 1935. Pp. 498. 12s. 6d.

2. Practical Biology for Medical Students

By C. J. WALLIS, M.A., Master-in-charge of Biology, University College School, Hampstead. London: William Heinemann (Medical Books) Ltd. 1936. Pp. 247. 12s. 6d.

1. The large number of books on elementary zoology which have appeared during the past twenty years may roughly be divided into two classes: those which describe the structure of a series of animals in entire isolation from one another (the majority), and those which deal with general principles but do not give sufficient facts to make those principles intelligible to the beginner. As an introduction to comparative morphology Dr. Woodger's book is one of the best we have seen. The structure of the types and the embryology of the vertebrates are well described with good illustrations, and the facts are coördinated and are given a real significance in relation to general principles such as adaptation and evolution. It is in fact a book which can be read with interest during a course of dissection. The emphasis is laid on morphology. This for beginners is probably advisable, and the author has not given as much life to his chapters on physiology as he has done to those dealing with structure. It is to be regretted that in the last theoretical chapter, which has been rewritten in the second edition, the evidences for the theory of evolution are not discussed in the light of the relevant facts which are all supplied in various places but not coördinated.

2. This is an improvement on other elementary practical books in that an attempt is made to illustrate the principles of biochemistry and physiology from animals as well as from plants. The experiments suggested are such as can be performed without complicated apparatus. It is to be regretted that simple experiments in animal physiology such as the action of cilia, muscles and nerves, fertilisation, growth, and regeneration are not included. The directions for dissection, preparation of slides, and observation of embryological material are good, but not better than those to be found in many other text-books.

Traité de physiologie, normale et pathologique

Tome X. (deux fascicules). Edited by G. H. ROGER, Hon. Professor of Physiology, and L. BINET, Professor of Physiology in the Faculty of Medicine, Paris. Paris: Masson et Cie. 1935. Pp. 1580 (2 vols.). Fr. 220.

ALTHOUGH this work consists of 11 volumes, that now issued, Vol. X., completes it, for the eleventh volume has already run into two editions. Vol. X. is the longest of all, and is divided into two separately bound parts, the second of which deals mainly with the special senses. Multiple authorship makes inappropriate any general criticisms; some of the articles would make books in themselves. It would almost be easier to review the Bible, which is at least divided into the Old and New Testaments. The subjects now treated are as follows: psychophysiology, cerebellum, pons and medulla, spinal cord, cerebrospinal fluid, cranial nerves, autonomic nervous system, physiology of skin, touch, speech, hearing, vision, taste, smell. The style and approach of the numerous authors are as various as their subjects, but the articles on the cerebellum and the autonomic system may be picked out as most in keeping with the modern physiological viewpoint. The former is based on phylogenetic as well as on experimental studies, and is as sound an account of cerebellar function as could be written in the present state of the subject. The latter provides an excellent historical résumé of the numerous generalisations which have been attempted from time to time on the function of the vegetative nervous system, besides giving a good account of its physiology. The bibliography of the article on the cerebellum is good, and the list of references to literature on the sympathetic and parasympathetic appears to us to be exhaustive.

The other articles, with the exception of that on speech which treats the subject historically and is extremely interesting, are dominated by the old "anatomical" tradition; they are encyclopædic but lack vitality. One must hasten to add that reflex action is dealt with in Vol. IX. of the series, and in a comprehensive work of this sort a place must be found for the bread and butter as well as for the cakes and ale. Although some of the sections make dull reading, this is often inevitable and does not detract from their value for purposes of reference. The well-illustrated and full account of the cranial nerves and their lesions is excellent, and is perhaps the most conscientiously written part of the book. The article on the cerebro-spinal fluid also contains much useful information, clinical and pathological as well as physiological. The remainder of the articles are no more, and sometimes rather less, than one would expect. The physiology of the skin is treated thoroughly and unimaginatively, but is misplaced, having nothing to do with the nervous system;

there is a separate section on the physiology of touch. If the skin article had been omitted and that on vision correspondingly enlarged (and treated as methodically), the balance of the book would have been improved.

Speaking generally, we can definitely recommend this volume as useful, particularly to those wishing to restore contact with the often neglected French literature. In places it is outstanding, and those who contemplate adding it to their library will be well advised to consult its pages on the subjects in which they are especially interested and be guided by their impressions after such a survey. Most of them will proceed to business.

Diseases of the Nose and Throat

For Practitioners and Students. By CHARLES J. IMPERATORI, M.D., F.A.C.S., Professor of Clinical Otolaryngology, New York Post-Graduate Medical School; and HERMAN J. BURMAN, M.D., Instructor of Clinical Otolaryngology to the Medical School. London and Philadelphia: J. B. Lippincott Company. 1935. Pp. 723. 35s.

THIS book is, as stated in the preface, written to supply answers to the questions with which the practitioner and senior student are constantly confronted, "what is the diagnosis of this condition and how shall I treat it?" The arrangement is unusual, in that symptoms, diagnosis, and treatment are placed first, and the pathology and causation of the diseases are considered at the end of each discussion; this has the advantage of enabling the busy reader to find the treatment recommended quickly, but it often makes it difficult to visualise the precise condition under discussion. For instance, the symptoms, diagnosis, and treatment of ulceration of the nasal septum are described, and at the end of the section we find, under the heading aetiology, that it may be caused by such general diseases as tuberculosis and syphilis which, however, have not been mentioned in the paragraph on treatment.

The book is arranged throughout in tabular form, which does not make for easy reading; indeed, it is obviously intended rather for quick and ready reference than to give the student a comprehensive knowledge of disease. This method is unsuited to teaching the characteristics and behaviour of such a protean affection as tuberculous laryngitis, or to giving real help in the diagnosis of cancer of a vocal cord. The arrangement of the work naturally makes for dogmatism and for errors of statement. Of malignant disease of the tonsil it is said that extirpation by surgery or electrosurgery is imperative; treatment by radiotherapy, not mentioned here, is discussed in a separate section of the book. Killian's operation on the frontal sinus is recommended as the external operation almost universally employed; in this country it has been largely replaced by a limited opening through the floor of the sinus with removal of the fronto-ethmoidal cells. In the treatment of chronic laryngitis, potassium iodide in doses of 15 drops is advised.

These criticisms are called for. But the important thing remains that the work is exhaustive in scope, covering concisely almost every disease and lesion of the throat and nose; the technique of methods of examination and treatment is well described and illustrated, and there is a good index. While it is hardly to be recommended to the student desiring to gain his first general knowledge of the speciality, it will be useful to him, and to the practitioner.

THE LANCET

LONDON: SATURDAY, JANUARY 25, 1936

KING GEORGE V

ALTHOUGH the final illness of His Majesty KING GEORGE V. was brief the country had been acquainted by regular bulletins of the ominous nature of his symptoms. All must have known from the very onset, medical men and public alike, that the issue might be the gravest, taken in connexion with his serious illness of seven years ago. We then had laid before us, in regular and candid statements, the story of a brave man's struggle, now advancing, now decliping back, now reaching a point when victory might reasonably be expected, and now falling to the level when nothing but defeat could be anticipated. The story, then unfolded to us with pathetic clearness, none can have forgotten, and the wonder has been that the survivor of such an ordeal should have been able to face the responsibilities of a real and active monarch, one who lived up to his own ideal as father of his people. Great worker and great sportsman as the KING was he met with anxious conscientiousness his multifarious engagements despite his physical delicacy. He lived and he has died a great King, and not only is this the knowledge of his sorrowing subjects to-day, but it will be the certain verdict of posterity when the vast events of his reign are seen in their proper perspective. It is a fine and consoling reflection that the occasion of his jubilee offered a unique opportunity for a demonstration of genuine affection and admiration from all classes, and his last broadcast, put the seal upon those feelings of love which were felt for him as a man. The KING spoke, with obvious emotion, of the personal link existing between himself and his people. "I am thinking," he said, "not so much of the Empire itself as of the individual men, women, and children who live within it, whether they are dwelling here at home or in some distant outpost of the Empire." His closing words were: "I send to you all, and not the least to the children who may be listening to me, my truest Christmas wishes, and those of my dear wife, my children, and grandchildren who are with me to-day." The message was heard throughout the world, and drew for the millions who heard it a picture of the great ruler as one who cared for his subjects as a father.

KING GEORGE V. was born on June 3rd, 1865, at Marlborough House, and succeeded to the throne on May 6th, 1910, being crowned at West-

minster Abbey in June of the following year. He was the only surviving son of his father, an elder brother, the Duke of Clarence, having predeceased that father. For a brief period he made use of the ancient royal title of Duke of Cornwall, until, after a fitting interval, he became Prince of Wales. Before he was heir to the throne he remained a working officer in the Royal Navy; his record in the Senior Service was that of a capable and strenuous officer, and he never lost his deep love of the sea. There is no doubt that the devotion to duty and the *bonne camaraderie* which distinguishes the personnel of the Navy counted for much in the manner in which the KING met his responsibilities and filled his post as the National Chief, for rectitude, simplicity, and sympathy formed his daily expression of conduct. Assuredly in the dealings of his kingdom with other countries these plain characteristics of our ruler played an effective part. He may not have had the intimate knowledge of the Royal circles of Europe which made his father so conspicuous a figure in continental politics, but he was as free from party bias as KING EDWARD, and as firm in the times of political unrest prevalent at his accession to the throne as his father had been before him, as respectful to the constitution and to the authority of Parliament, and as sound in his knowledge of affairs. When all political dissensions became of secondary importance to the nation by comparison with the world issues in which the war involved the Empire, KING GEORGE, in public and private capacity alike, proved himself a veritable leader and example. He was throughout unsparing in his efforts, loyal to his advisers, and a sharer practically in the anxieties and privations of his subjects. Thus in the third period of his reign he reaped a splendid harvest of personal affection from his subjects who year by year and even day by day grew to have a better understanding of their KING. We all knew that he was a good man, and it must surely add poignancy to our grief to recall that this patriot in the largest sense had so intimate a love for England. The KING's love of England, English scenes, English sports, and his English domestic life endeared him to his subjects in a very particular sense. It has been well known to his medical advisers for some years past that he could have enjoyed more certain health and probably prolonged his days by spending the winter months at warmer and more sheltered places than his London or his Sandringham homes, but the KING remained in England not only from that sense of duty which made him the most serviceable of monarchs, but because the Norman castle, which gives to the Royal House its present name, and the heaths and marshes of Norfolk made an appeal to him more urgent than the balmier prospects of the continental health resorts could offer. He did not avail himself of climatic advantages which are only open to a small

proportion of his fellow Englishmen, and in their memory of him this will count.

To the profession of medicine KING GEORGE V. was always a sterling friend, and although his name is not associated, as is that of his father, with any medical movement of a significance comparable to the foundation of King Edward's Hospital Fund, it has been abundantly apparent that in deed as in will he realised the importance, in all the social history of to-day, which underlies medical service. And his deep interest in the voluntary hospitals of the country was manifested in the ægis which he extended to the voluntary hospital movement, where he carried on his father's work, and in the fact that during his reign it became an established tradition that members of the Royal Family should be heads of hospitals, and that the Royal Family should take part in a practical manner in all developments of medical charity.

THE CAUSES OF VARIATIONS

THE discovery and use of cabbages which would stand the winter in northern climates was an event of a sanatory importance comparable to that of the invention of vaccination against small-pox. When there were no winter greens available for man and no turnips or swedes to provide fresh meat, the population must have come to the early spring in poor trim, for scurvy and near scurvy must have been the common lot and dovecots were only for the few. The first flush of edible green in the countryside is still often welcomed by nibbling the hawthorn buds on the roadside though perhaps those who do it know the reason for their ritual as little as the cook knows why there should be greens of some sort every day. With his unerring instinct for what is good, man seized on the cabbage and has grown it in one form or another as universally as he has the potato, partly for himself and partly for his animals. And many varieties there are—spring cabbage, curly kale, cauliflower, brussels sprouts, kohlrabi, and the rest. All of them breed true to seed and with ordinary luck we can have kale or broccoli at will, which means that all this variation is due to germinal changes and not to environment or special methods of cultivation. They are all in fact sports, or as we say nowadays mutations, of the plain wild *Brassica oleracea* which lives here and there on our southern coasts and behaves in winter like any natural biennial plant.

And in the eighteenth century, along with the introduction of cabbages and turnips and the depopulation of dovecots, began the revolution of thought which led men to suspect that they lived in a moving world and not as they had supposed in fixed and settled surroundings which had nothing more to expect than the crack of doom. They began to see change and infer it and to be curious about its nature and causes. Their thoughts crystallised once about the origin of species and have crystallised again in this century from MENDEL'S discovery of unit characters and alternative inheritance. At the moment there is a pretty

general consensus of opinion that many of the features of animals and plants are primarily determined by specific particles in the chromosomes, and there is abundant evidence that the sudden heritable changes, which are always found if large populations of live organisms are closely examined, are due to changes in these genes. Mutation is a plain fact of nature, and there is no visible end to the possibilities which would be to hand if its occurrence could be brought under control. It would indeed be strange if people were not acutely interested in trying to discover the causes of germinal changes, in the hope of promoting good things such as brussels sprouts and of preventing evil things such as idiots. Our readers will therefore perhaps be interested in a paper which Mr. HAMSHAW THOMAS, F.R.S., of the Cambridge botany school, gave to the Linnean Society, printed in the last two numbers of *Nature*. The particular point which he discusses is the possible influence of the penetrating radiations known as cosmic rays which pour on to the earth out of space and take origin very possibly in the annihilation of matter. That this kind of influence can cause mutational change was established when MULLER obtained heritable variations by the action of X rays. But whether short wave-length radiations have any special action apart from their ability to penetrate cells and, by virtue of their small size, to injure only a limited part of a cell, is uncertain; it is perhaps generally true that if many cells are knocked about by any harmful agent a proportion of them will suffer only that particular local damage required to produce a mutation. Be that as it may, and admitting the probability that HARRISON brought about germinal changes by feeding caterpillars with poisonous salts, the influence of radiation is an attractive suggestion. Experiments in which animals have been more or less shielded from cosmic rays by being kept as far as may be in the bowels of the earth have so far given no clear answer; negative results of observations which are in the evolutionary sense of momentary duration are of no great weight. Cosmic rays are few and far between; many of any chromosomal injuries which they may inflict would be incompatible with life and in any case only a minute proportion of germ cells give rise to individuals sufficiently adult to show their characteristic features. Dr. HAMSHAW THOMAS appeals to evidence of another kind. It being known that the intensity of cosmic radiation increases greatly with altitude so that there is about ten times as much at 20,000 feet as at sea-level, he points out that there are many more kinds of plants on mountains than on plains, they they are more variable and include a larger number of peculiar local species. Thus Costa Rica, largely mountainous and only half the size of Florida, contains as many species of plants as the whole of the south-eastern United States; there are 60 varieties of wheat in Afghanistan and only 12 in Italy, and many more mountain than low-land species of primula, while several naturalists have remarked on the abundance of endemic species on mountains.

Of these facts there are obviously other possible explanations, but Dr. THOMAS's suggestion that an abundance of cosmic rays is responsible for an excess of variation needs further examination and, if possible, experiments on a large scale. If there is much in it, it would probably be apparent in a thorough study of the high Andes where there is a considerable human population, partly native, partly immigrant, which badly needs examination against the background of Western medicine. The question is one of great theoretical and practical importance, and it is perhaps not too much to hope for a more or less permanent commission to be established there to see what can be ascertained about the variability of men, animals, and plants, and to make a thorough study of the medical position there. It is true that cosmic radiation is not as abundant in Peru as it is further north, but the presence of a considerable indigenous population well outweighs this disadvantage. Man is far better known than any other animal, and careful observation should be able to determine whether he is more liable to mutations in the Andes, possibly also in Tibet, than elsewhere. And where man lives experiments can be made, though in this connexion where great numbers and long times are involved observation may be more likely to find an answer.

A NEW PUBLIC HEALTH CODE

THE statute book is, in CROMWELL's phrase, an ungodly jumble. More than any other department the Ministry of Health labours to remove the reproach. Not long ago the departmental committee, which it had appointed under the chairmanship of the late Lord CHELMSFORD, produced the admirable code which became the Local Government Act of 1933, re-writing in modern language and compendious form a mass of confused and overlapping enactments. And now the same committee, under the experienced guidance of Lord ADDINGTON, has produced another big Bill (Cmd. 5060; 3s. 6d.) which forms a draft code of the existing laws of public health. Overhaul of our health legislation was indeed overdue. The principal act of 1875, parent of a scattered progeny, was itself descended from acts of 1848 and onwards which it all too faithfully reproduced. Much has happened in Whitehall and in the countryside since those early years when panic over an epidemic of cholera was one of the chief motives of legislation. Prevention, and not merely cure, of disease is now the accepted policy. The individual's health is recognised as the community's concern. Slum clearance, water-supply and sewerage, maternity and child welfare, and school medical services are related parts of a national effort. Comparison of ancient and modern statistics of cholera, plague, and small-pox, typhoid, diphtheria, and tuberculosis, is a sufficient reminder of progress. In the statutory structure of public health over the same period the central and local authorities have been transformed. The Ministry of Health has replaced the Local Government Board of 1871. Boards of guardians

are gone. Popularly elected county councils, created in 1888, now form, with county boroughs, fewer and bigger units; with ampler resources, a wider outlook and a rational re-allotment of institutional facilities, they administer public health in the spirit of social service rather than of poor relief. A principal act of 1875 was hardly fit to govern such developments.

The departmental committee was directed not only to frame consolidating legislation, but also to consider what amendments would facilitate their work and would secure simplicity, uniformity, and conciseness. Fifty-year-old clauses will not stand literal reproduction to-day. The 1875 Act, for instance, contained no fewer than four differently expressed provisions as to power of entry. Pure consolidation would dictate the separate re-statement of each in the new code, but common sense will substitute one uniform provision for four. Elsewhere a handful of random examples will show the opportunity for unobtrusive modernisation. Section 134 of the 1875 Act enabled regulations to be made for speedy interment of the dead and house-to-house visitation in times of formidable epidemic. No such regulations have been made for many years, and the section can clearly be dropped. Nor is it necessary to reproduce Section 138 whereby poor-law medical officers and other doctors who attend patients on board ship (under regulations prescribed by Section 130) can recover charges from ship-owners; the provision is a dead letter. An enactment of 1907 forbade the connexion of drainage with a rain-water pipe; modern sanitary practice is against connecting a rain-water pipe with a sink; the new clause incorporates a restriction to this effect. The 1875 Act, as already noted, was itself framed out of a group of earlier statutes. Perhaps this is why it uses, without definition, sets of alternative phrases abhorrent to the modern draftsman. It speaks of "infectious disease," "fever or other infectious disease," "infectious disorder," "dangerous infectious disorder," and "dangerous infectious disease." The Customs Act of 1876 uses the phrase "highly infectious distemper." The Infectious Disease (Notification) Act of 1889 contains a catalogue, it is true, of specific "infectious diseases"; but the vocabulary of the acts is needlessly confusing. The new code uses simply the two phrases "infectious disease" and "notifiable disease." Incidentally, in re-stating the list of "notifiable diseases" from the 1889 Act, it omits to specify the fevers therein described as "continued or puerperal"; the "continued fever" was an old term, covering undiagnosed pyrexias, which is nowadays of little significance, and "puerperal fever" is left, for administrative simplicity as well as on medical grounds, to be governed by regulations such as those whereby in 1926 the Minister made puerperal pyrexia notifiable. On the whole the committee, composed of members with legal and administrative rather than medical qualifications, has refrained from stiffening the law in directions where medical opinion might have recommended it. The committee found its hands full enough without pursuing

medical questions. It leaves the general improvement of the law to future parliamentary effort.

The new code consists at present of 334 clauses. Had it dealt with every aspect of what might popularly be regarded as public health, a thousand might have been required and an unwieldy document would have resulted, with multiplied vulnerabilities. The project excludes housing, mental treatment, midwives, burial and cremation, building lines and open spaces, and those unrelated Home Office topics which have been grouped in public health acts of the past. It confines itself to strictly public health provisions in relation to the prevention and treatment of disease—i.e., as regards environment, the arrangements for drains and sewers, water-supply, buildings and the abatement of nuisances, and, as regards personal hygiene, arrangements for hospitals, maternity centres, and the like. The draft bill covers the Canal Boats Acts, the Baths and Washhouses Acts, the Maternity and Child Welfare Act, 1918, the Nursing Homes Registration Act, 1927, and the infant life production provisions which are the sole surviving part of the Children Act, 1908. Its plan and its limitations, and the details of its proposed changes, are set out with well-reasoned justifications in the blue-book (Cmd. 5059; 2s.) which accompanies the bill. One final word of

warning we respectfully add. Under technical parliamentary rules a bill which is purely consolidation cannot be amended. The process of consolidation with amendment is usually performed by framing one bill for consolidation and another for amendment, the latter being passed first and then swallowed up by incorporation in the former. This process was not adopted with the new Public Health Bill if for no other reason than that the separate amending bill would have been distracting in its complexity and unintelligible in its terms. As the new bill includes a modicum of amendment along with pure consolidation, it is open to any member of Parliament to propose further amendments. If such a right is exercised on a large scale, the bill is doomed, and all the disinterested labours of its expert authors will be lost. The same situation arose over the parallel Local Government Bill in 1933, but private members nobly refrained from sabotage and the code was successfully passed into law. Those who are not satisfied with the new public health code should hold their hands and effect their amendments by separate bills in the future. Amendment indeed will be far more easy once this clear code receives the Royal Assent. To choke it to death now by excessive alteration would be a crime against public health administration.

ANNOTATIONS

STAMMERING

ANY defect of speech is a serious handicap to a school leaver in search of employment. Stammering is far the commonest of speech defects; about one child in a hundred stammers, four times as many boys as girls. The stammer differs from other speech defects in two respects: under certain conditions no stammer is apparent, and it does not respond to the usual speech-training methods—suggesting that a stammer must be more than a mere defect of speech. Regarded as a speech defect it is essentially an interference with the coördination of the muscular articulatory mechanism, associated with some disturbance of respiration, particularly, according to Seth and Guthrie, of the synchronisation of thoracic and abdominal breathing. Its more obvious manifestations take usually one of two forms: the "clonic," popularly known as the stutter, in which the sound to be produced is repeated several times; and the "tonic" in which a silent period, long or short, precedes utterance of such sounds as give difficulty. The "tonic" form may be accompanied by spasmodic contractions of the muscles of face, lips, larynx, or even limbs, which appear to take the place of the articulatory contractions of the stutter.

Many theories of causation have been advanced, but there is a growing convergence of opinion to-day towards the view that stammering is in essence a neuropathic condition and as such therefore may be attributable to many causes. It cannot have escaped the observation of any students of the condition that stammerers are usually nervous children. A special inquiry¹ among Manchester school-children, initiated by Dr. H. Herd, revealed the frequency of neuropathic symptoms such as

excitability, irritability, abnormal fears, enuresis, night-terrors, nail-biting; 41 of 53 stammerers were of a very excitable type. These symptoms are not the result of the stammer, but are parts of the stammering syndrome. Stammering, then, is not merely a disorder of speech, but a disorder of personality, an emotional disturbance. Stammerers are, in fact, one type of "difficult child." As is shown in a Rochdale inquiry,¹ it is the child who lives in an "atmosphere of over-solicitude" whether through his place in the family, through illness, or other cause who, when some crisis (to him) occurs in his life—the arrival of a baby sister or brother, change of school or teacher, fright, loss of a parent, family disharmony—fails to adjust normally and may develop a stammer, just as he may develop asthma.² There may, in addition, be some inherited neuropathic tendency, difficult often, however, to separate from the environmental influence of a neuropathic parent.

Realisation of this wider aspect of stammering involves some enlargement of the scope of treatment beyond the mastery of vowels, of consonants, and their combinations. The methods of a child guidance clinic may have to be employed in order to deal with possible maladjustments and to elucidate the subtle psychological factors, if such there be. In the solution of these matters the parent and the teacher may have a large part to play. So far as the individual child is concerned, the first essential is the production of self-confidence; its lack is characteristic of the stammerer and the inferiority complex is most manifest in the presence of strangers. This defect must be steadily overcome by the suggestion of the teacher. Next in importance to suggestion is relaxation, the significance of which is apparent

¹ Quoted in "The Health of the School Child" (report of the C.M.O. of the Board of Education for the year 1934), p. 101.

² THE LANCET, Jan. 11th, 1936, p. 96.

from the tenseness of effort displayed by the stammerer in his struggles to speak. Natural speech should proceed in an easy flow. The act of speech should be more or less unconscious; there should be no sense of strain, no tensely contracted muscles. The habit of general muscular relaxation can be fostered by exercises alternating with short periods of complete rest. The older method of speech therapy involved a too intense concentration of effort on the production of sounds and contradicted the principle of relaxation. For this reason some authorities have dispensed with any specific speech training and have concentrated, if the use of the word is allowable, on relaxation. This treatment has been advocated and practised by the London education authority with considerable success under the control of Dr. E. J. Boome. The careless habits of speech, however, that many stammerers develop do justify some practice at least in correct speech in the form of reading along with others, or reciting in dramatic form, conditions under which a stammer naturally tends to disappear. Parents and teachers must cooperate if a satisfactory result is to be reached and retained; education authorities should modernise their methods of treatment in accordance with recent knowledge, invoking the help (see p. 225) which the Central Association for Mental Welfare offers.

SUPPLY OF BLOOD-GROUPING SERA

FOR an efficient and safe transfusion service it is necessary to determine quickly and accurately the blood group of prospective donors. In practice this requires stock sera against which the grouping can be tested, but so far the blood-grouping sera on the market have for the most part been unstandardised as regards potency, and the expense has militated against their general use. For these reasons it has been the custom of various independent laboratories to make their own stock blood-grouping sera from Group 2 (A) and Group 3 (B) individuals, any member of the staff, whose blood was of either group, being considered a convenient source of supply. The amount of isoagglutinins, the responsible factors in such sera, has not, with rare exceptions, been estimated. Dr. H. F. Brewer, medical officer to the British Red Cross Blood Transfusion Service, working on the blood donors of this organisation, has found a normal variation ranging from 1 in 2½ up to 1 in 800 in the titre of the α and β isoagglutinins in the sera of Group 3 (B) and 2 (A) donors respectively. Repetition at intervals of the titre estimations on batches of donors proved that the titre of isoagglutinin content for the serum of a particular donor is practically constant. A point of interest is that the average titre of the α isoagglutinin in Group 3 (B) serum is higher than that of the β isoagglutinin in Group 2 (A); this has also been pointed out by K. Kettel, and applies to the α and β isoagglutinins present together in the serum of Group 4 (O) individuals. The isoagglutinin titre of grouping serum gradually deteriorates with storage, and obviously the higher the initial titre the longer will be the period during which it can be used; a serum with an isoagglutinin titre of 1 in 200 will maintain a satisfactory potency as regards agglutination for a period of six months, even at room temperature. If the initial titre should be less than 1 in 25, it may deteriorate within this time to such an extent that it fails to clump red cells containing the homologous isoagglutigen, and an error in blood grouping will result.

In an attempt to make a supply of grouping sera

of high titre and of cheap price generally available throughout the country, the Red Cross Transfusion Service has arranged to provide free to Messrs. Burroughs Wellcome and Co. serum in bulk from Group 2 and Group 3 donors specially selected on account of their high isoagglutinin titre (1 in 200 or above); such serum will be put up in capillary tubes each containing about 0.1 c.cm. and packed by the firm mentioned at a cost just sufficient to cover expenses, and will be distributed from the Blood Transfusion Service, 5, Colyton-road, East Dulwich, London, S.E.22 (Tel.: Forest Hill 2264), to whom application can now be made. The price is 6s. per dozen pairs of capillary tubes if supplied to hospitals, medical practitioners, and provincial services affiliated to the London service; 12s. per dozen pairs to non-affiliated hospitals and others. Instructions about blood-grouping technique will be enclosed. The scheme should facilitate blood transfusion generally by rendering blood grouping more readily available and more accurate. At the present price it may be practicable for every medical practitioner and medical institution to keep a supply and replenish it when there is any risk of staleness. Undue calls on Group 4 (O) ("universal") donors should now diminish.

THE SURGERY OF THE SYMPATHETIC

A BRIEF report of the Tenth Congress of the International Society of Surgery appeared from a correspondent in THE LANCET of Jan. 11th.¹ In this report mention was made of the plea put forward by Prof. Archibald Young, of Glasgow, for the consideration of peri-arterial sympathectomy in properly selected cases, Prof. Young contending that though the discussion before the Congress was nominally restricted to the surgery of the lumbar sympathetic it would have been more profitable if it had been extended to include the results obtained by numbers of surgeons from peri-arterial operations in the limbs and on the inferior mesenteric artery, and also to review their experience of presacral neurectomy. He repeated the claims which he has formulated elsewhere for peri-arterial neurectomy which in his opinion had suffered undeserved neglect, stating that in his hands the operation had yielded satisfactory results in 65 per cent. of cases. Turning to lumbar ganglionectomy he stated that in his experience the operation had given excellent results in Raynaud's disease, and that more was to be expected of it in arteriosclerosis than in thrombo-angiitis obliterans. He had experienced striking success in a few cases of chronic arthritis and this encouraged him to advocate lumbar ganglionectomy though the patient may be bedridden. He also referred to the treatment of Hirschsprung's disease and of painful conditions of the bladder by operations closely allied to lumbar sympathectomy.

AVERTIN ANÆSTHESIA IN CHILDHOOD

EVIDENCE of the interest taken in Sweden in Avertin anaesthesia will be found in four papers published in *Nordisk Medicinsk Tidsskrift* for Dec. 21st. It was in August, 1932, that avertin was first adopted by the large children's hospital, Kronprinsessan Lovisas Vårðanstalt, and between this date and the end of October, 1935, it has been used in 1250 cases without mishap and with excellent results. Its administration in an enema saves the child from the struggling and the psychic disturbances which

¹We take this opportunity of mentioning that the official representative of the Royal College of Surgeons of England at the congress was Mr. C. H. Fagge.

sometimes follow the application of an ether mask to the face, and the profuse bronchial secretion evoked by ordinary ether anaesthesia is also avoided. Ether is not, however, totally dispensed with in this hospital, and a little is usually given (from 10 to 30 c.cm.) after consciousness has been lost under avertin. Dr. Einar Perman, who provides this information, states that avertin was first used only in exceptional cases and when lesions of the respiratory tract contraindicated ordinary inhalation anaesthesia. Its advantages, however, soon became so evident that it has now been adopted as the standard anaesthetic for children, who do not react to it with the psychic upsets occasionally seen in adults. Avertin is now used for all circumcisions and operations for hernia and mastoid disease. In many cases of empyema difficult to locate, the exploratory punctures as well as the operation itself are performed under avertin, which has also proved valuable for cystoscopic examinations. In another paper, Dr. Georg Bremer reports from the same hospital his observations on avertin anaesthesia in dentistry. He has found avertin the solution to the problem of the child under school age requiring unavoidably painful dental treatment. His experiences in this field since the beginning of 1934 concern two-score children and a couple of young adults whose mental condition would have been a contraindication to any dental operation carried out with only a local anaesthetic. The remaining two papers describe the treatment of tetanus with avertin—a method familiar in this country through the writings of L. B. Cole¹—and the temperature of the skin during avertin anaesthesia.

THE PHYSIOLOGY OF FERTILITY

RECENT analyses of population trends suggest that reproduction, not only in England and the rest of North-West Europe but also in other regions inhabited by Europeans, is proceeding at a dangerously slow rate, and that unless a pronounced increase in the number of births occurs before long, the relevant populations will be considerably diminished and their age constitutions greatly altered. In an address delivered to the Eugenics Society on Tuesday last, Dr. S. Zuckerman suggested that this fact puts a completely different complexion on the usual view that is taken of man's fertility. Even allowing for full working capacity, the human reproductive machine does not compare favourably with that of most other vertebrates, for even apart from specially designed contraceptive measures, many normal and pathological factors militate against a higher fertility. For example, the childbearing period in woman forms a relatively short part of her total life compared with that of most other mammals.

The normal limiting factors to the process of conception itself, said Dr. Zuckerman, are not conducive to a very high fertility. Ovulation both in man and in old-world primates, it is now believed, occurs at some time during the middle period of each menstrual cycle. Occasionally, too, and for reasons not yet understood, ovulation may fail to occur in otherwise normal menstrual cycles. There are no data regarding the viability of the ovum of any primate, but if investigations on lower mammals are any guide, the human ovum does not live more than a matter of some hours. Sperms are also short-lived, and unless the male and female gametes meet within a fairly brief critical period conception during any given cycle is impossible. Man and most of his

fellow old-world primates do not experience, as do most other mammals, a sharply demarcated oestrus which would ensure that insemination occurred at the most favourable time for conception, and it would almost seem that an increased frequency of coitus is the primate mechanism which replaces from this point of view the oestrus of the lower mammal. Discussion still continues on the question of the occurrence of a "safe period" in the menstrual cycle; the balance of clinical evidence seems to be in its favour. Dr. Zuckerman pointed out that in the absence of any available sign of ovulation in man, the further analysis of the "safe period" into its two components, the period of viability of the sperm and the period of viability of the ovum, is clearly impossible. Such an analysis is at present being conducted on monkeys which in their sexual skin cycles provide a clear external index of the occurrence of ovulation. The data so far collected do not provide any information on these two particular points, but clearly support the idea of only a limited period of fertility in each menstrual cycle.

DILATATION OF THE URETERS

A LEADING article in our last issue described some recent investigations into the cause of dilatation of the ureters during pregnancy. It appears that Traut and McLane¹ have also been studying the tone of the ureters during pregnancy using, like Baird, a modification of the hydrophorograph originally introduced by Trattner.² Their conclusions agree with those of most other workers. They found a definite atony of the ureters, beginning in the third month of pregnancy and reaching its peak in the seventh and eighth months. During the last month there seemed to be a definite return of muscular irritability as expressed by peristalsis and response to stimulation. They ascribe the dilatation of the ureters partly to the pressure of the gravid uterus and partly to this atony, which they believe to be due to some hormonal factor.

VITAL STATISTICS FOR 1935

THE Registrar-General has issued a provisional statement of the figures for birth-rate, death-rate, and infant mortality for the year 1935.

—	Birth-rate.	Death-rate.	Infant mortality-rate.
England and Wales ..	14.7	11.7	57
121 county boroughs and great towns, including London ..	14.8	11.8	62
140 smaller towns ..	15.1	11.4	55
London (administrative county)	13.1	11.3	58

The smaller towns are those with estimated resident population of 25,000–50,000 at the 1931 census. The birth- and death-rates for England and Wales as a whole are calculated on the estimated mid-1935 population, but those for the towns aggregates and for London are calculated on the estimated mid-1934 populations. The birth-rate is based on live births, the death-rate on crude deaths.

The birth-rate for 1935 is 0.1 per thousand below that of 1934 and is 0.3 above that of 1933, the lowest recorded. The crude death-rate is also 0.1 below that of 1934, the only years with a lower or similar record

¹ THE LANCET, 1935, ii., 246 and 256; Quart. Jour. Med., 1935, iv., 295.

² Traut H. F., and McLane, C. M.: Surg., Gyn., and Obst., January, 1936, p. 65.

³ Trattner, H. R.: Jour. of Urol., 1932, xxviii., 1.

being 1923 (11·6), 1926 (11·6), 1928 (11·7), and 1930 (11·4). The infant mortality-rate is the lowest recorded, the previous record years being 1934 (59) and 1930 (60). The rates are provisional and are issued for the information of medical officers of health, but they are not likely to require substantial modification.

TUBERCULOSIS IN HOSPITAL EMPLOYEES

THE investigations of Scheel and Heimbeck at the Ullevaal Hospital in Oslo have stimulated statistical investigation in other hospitals whose employees have shown a disquieting tendency to develop tuberculosis. The latest report¹ on this subject comes from the tuberculosis hospital of Söderby, Stockholm. Its medical superintendent, Dr. A. Gullbring, has found that between 1918 and the middle of 1935 there have been 45 cases of tuberculosis developing in a staff of 2016—an incidence of 2·2 per cent. While this rate was 2·6 per cent. (40 out of 1525 persons) among the staff in direct contact with patients, it was only 1 per cent. (5 out of 491 persons) among the administrative staff. Since 1928 new members of the hospital staff have been tested with tuberculin (Mantoux's test), and 20 per cent. of the 484 persons thus examined have been found to be tuberculin-negative. All the negative reactors tested at a later date showed a positive reaction. Of the tuberculin-tested employees, 19, or 3·9 per cent., have since developed tuberculosis, including only one belonging to the administrative staff. A comparison of the originally tuberculin-negative employees with the originally tuberculin-positive employees showed that the subsequent tuberculosis-incidence was 8·4 per cent. among the former and 2·8 per cent. among the latter—an observation confirmatory of the Scheel and Heimbeck teaching that the tuberculin-negative probationer is much more likely to develop tuberculosis. It may be noted in passing that in another Swedish hospital, the Serafimer Lasaret, the practice has now been adopted of inoculating with BCG those of the hospital staff who are found to be tuberculin-negative. Valuable data should, therefore, soon be available wherewith to control the claims made on behalf of BCG inoculation of tuberculin-negative nurses by the authors of the Ullevaal experiment.

RUDYARD KIPLING

RUDYARD KIPLING was in every sense of the word a patriot; all classes of society from the highest to the lowest recognised his deep devotion to our country and admired his heartfelt expressions thereof. That some could not go the whole way with him proves the difficulty that will arise always when the claims of fervent nationalism clash with the international spirit; but pause to any criticism is given here in Kipling's case by the tributes to his genius and to his fiery love of humanity paid by the press of the civilised world. Where Kipling will stand in the estimates of an extended future no one can say exactly, but he must long remain a great figure. And this position has been definitely allotted to him by the decision that he should be buried in the Poets' Corner of Westminster Abbey. Kipling was passionately poetical while replete with exact knowledge of many material things; he was deeply moving and quite slangy; he was a master of the English language and original, even unprincipled, in his use of it; he was a brilliant story-teller, the

most widely read poet of his day, and unsurpassed as a journalist.

It is fitting to record from his own lips his attitude towards medicine. In an address delivered to the students of Middlesex Hospital the following passage occurs: "Every sane human being is agreed that this long-drawn fight for time which we call Life is one of the most important things in the world. It follows therefore, that you, who control and oversee this fight and you who will reinforce it, must be amongst the most important people in the world. . . . In all times of flood, fire, famine, plague, pestilence, battle, murder, or sudden death, it will be required of you that you report for duty at once, go on duty at once, and remain on duty until your strength fails you or your conscience relieves you, whichever may be the longer period. This is your position. These are some of your obligations. I do not think they will grow any lighter." On another occasion, addressing the guests at a Hunterian banquet at the Royal College of Surgeons of England, he said: "Your dread art demands the instant, impersonal vision which in one breath, one beat of the pulse, can automatically dismiss every preconceived idea and impression, and as automatically recognise, accept and overcome whatever of new and unsuspected menace may have slid into the light beneath your steadfast hand. But such virtue is not reached or maintained except by a life's labour, a life's single-minded devotion." It was thoroughly characteristic of Kipling that the main thing which impressed him in the life of those who follow the calling of medicine was the claim made at all times and all places for the discharge of duty, for over and over again in prose and verse Kipling delighted to draw and extol the virtues of selflessness and resolution.

It is fitting for members of the medical profession, who know from experience the keen anxiety attached to the care of a patient whose cardiac reserve is slight and whose duties are onerous, to voice the gratitude of the Empire to Lord Dawson of Penn, on whom for eight years a heavy burden has fallen. It must have been due in no small part to his constant unobtrusive watchfulness as well as to his clinical wisdom that these years were for King George years of joyous fulfilment.

THE official proclamation of King Edward VIII. was made on Wednesday morning in pursuance with the Order in Council and in accordance with precedent. The proclamation was first read by Garter Principal King of Arms at the balcony in Friary Court, St. James's Palace, when a procession was formed and, flanked by the Royal Horse Guards, moved by way of the Mall and the Admiralty Arch to Charing Cross where the proclamation was again read by Lancaster Herald. On the site of Temple Bar a barrier marked the boundary of the City of London and at the corner of Chancery-lane the proclamation was read for the third time after formal admission to the City with the Lord Mayor in attendance. The procession then proceeded to the Royal Exchange where the proclamation was read for the fourth and last time.

KENT COUNTY OPHTHALMIC AND AURAL HOSPITAL. The extensions to this hospital, which was founded at Maidstone in 1847, are being opened to-day, Jan. 24th. A debt of £10,000 on the new aural wing which was opened in 1930 has still not been cleared and the hospital now carries a total debt of £15,000.

¹ Nordisk Medicinsk Tidsskrift, Jan. 4th, 1936, p. 14.

THE KING'S LAST ILLNESS

The following statement is based on authority :—

“THOUGH it is understood that for some weeks His Majesty KING GEORGE'S health had not been altogether satisfactory the KING was able to go out and in fact rode on his pony for a short time on Wednesday, January 15th. On Thursday, the 16th, the KING showed signs of a mild catarrh which soon began to abate. The ‘disquiet’ expressed in the bulletins of Friday and Saturday arose from evidences of cardiac insufficiency. The margin of cardiac reserve has in recent days been narrowing. This illness therefore arose from within and was in the nature of a culmination. It was thus not comparable to the invading streptococcal septicæmia localising at the base of the right lung from which KING GEORGE suffered eight years ago. It is true that that illness placed heavy burdens on the heart which may have had a causal relationship to this last illness. It is a remarkable achievement that KING GEORGE recovered from septicæmia and reigned over his Empire seven years through times which have been eventful and sometimes anxious.

“This last illness showed that the body carried through its work till its powers were ended and then came to rest after an illness short, and peaceful in its close.”



HIS MAJESTY KING GEORGE V. BEING RECEIVED BY SIR AUSTEN CHAMBERLAIN,
CHAIRMAN OF THE GOVERNING BODY, ON THE OCCASION OF THE OPENING OF
THE BRITISH POSTGRADUATE MEDICAL SCHOOL ON MAY 13TH, 1935.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXXXV.—THE PROGNOSIS IN DEAFNESS

II

(Concluded from p. 160)

Otosclerosis

THERE remains for consideration among the varieties of deafness attributable to lesions in the middle ear the important group of cases classed as otosclerosis; this is more common in females, is frequently hereditary, and is characterised by formation of new bone on the inner tympanic wall occluding the fenestræ, and, clinically, by the signs of middle-ear deafness with, at first, a strongly negative Rinné, good or increased bone-conduction, and marked loss of low tones, with a normal drum and Eustachian tube. Later there is often degeneration of the internal ear, but these patients, like other sufferers from middle-ear disease, rarely become completely deaf. Here, too, progress is not downwards along an even slope, but there are long stationary periods, often with a step down as the result of an illness, and sometimes an improvement with betterment of the general health. It happens not infrequently that otosclerosis is associated with some degree of chronic catarrhal otitis; in these cases attention to the hygiene of the nose, throat, and Eustachian tubes may be expected to give some improvement of hearing. Pregnancy has a peculiarly bad effect; although the hearing tends to improve again after delivery, it usually remains at a lower level than before, and it is sometimes advisable to induce abortion. Many forms of treatment have been tried and abandoned. A few otologists recommend a method of treatment by sonorous vibrations, introduced by Zünd-Burguet, in this affection as well as in chronic catarrhal otitis, but the results appear to be evanescent, and it has not been generally adopted. The late Dr. Albert Gray has employed weekly injections of thyroxine through the membrane into the tympanum with some encouraging results. Of surgical measures one, which holds out a faint hope for the future treatment of otosclerosis and of severe fibrotic occlusion of the fenestræ, consists in opening the bony labyrinth at the external semicircular canal, or in the region of the fenestræ, and covering the fenestration so made with a thin graft. In this way the hearing has certainly been improved, but there has been much tendency to relapse, due probably to the difficulty of keeping the opening patent and the graft from becoming rigid. Perhaps more lasting results may be obtainable by modification of the technique, but it must at present be acknowledged that no treatment has as yet any proved and lasting effect on the progress of this disease.

Nerve-deafness

This includes deafness caused by lesions of the labyrinth, the auditory nerve, or the nerve-paths to the brain, and is irremediable in a large proportion of cases, though not in all. Certain drugs cause deafness of this type; of these quinine and salicylates are the most important, and cause tinnitus at the same time. The hearing recovers when the drugs are withdrawn, but permanent impairment may follow continued large doses of quinine. Lead, mercury, and carbon disulphide may all produce deafness, while excessive use of alcohol and tobacco have a deleterious effect. Many instances of severe deafness following the administration of the salvarsan group

of drugs have been recorded; when syphilitic nerve-deafness is present salvarsan should be withheld until it has responded to mercurials. *Syphilis* causes nerve-deafness by affecting the cochlea and auditory nerve, and by producing basal meningitis; it may appear as early as the secondary lesions or as late as the development of tabetic symptoms. Improvement may follow early and thorough treatment, but often the disease progresses rapidly, and sometimes to complete loss of hearing; congenital syphilis is one of the commoner causes of deaf-mutism. *Epidemic cerebro-spinal meningitis* is accompanied by nerve-deafness with a frequency which varies in different epidemics from 4 to 30 per cent. and is a common cause of deaf-mutism; it is usually permanent but occasionally the patient recovers. *Toxic deafness* is common in enteric fever, but disappears during convalescence. Nerve-deafness is a rare complication of mumps; it is complete and incurable but, fortunately, usually unilateral. Measles, also, beside causing the common middle-ear infections, is an occasional cause of incurable bilateral nerve-deafness, probably of meningitic origin. Myxœdema has a bad effect on the hearing; any form of deafness in patients with hypothyroidism may be improved by thyroid extract. The patient with deafness resulting from traumatic *concussion* frequently recovers within a few days or weeks, but any impairment remaining after that time is likely to continue. The deafness due to fracture of the base of the skull is, of course, permanent.

Occupational deafness from prolonged exposure to noise is common in certain callings, such as riveting or machine-gunning; when established, it tends slowly to advance in spite of removal from the cause, and is only curable by change of occupation at an early stage. The single loud sound of an exploding shell was a frequent cause of deafness during the late war; improvement usually occurred during the first few weeks but some degree of deafness often remained. Allied to this is the condition called "*shell-shock*" deafness, the victim having been in action or buried by an explosion and becoming and remaining totally deaf. Probably he will have been deafened by labyrinthine concussion which recovered, but a psychic deafness persists. In such cases the hearing can be restored by appropriate psychiatric treatment, but it is difficult to distinguish sufferers from psychic deafness from those who have received organic damage of the cochlea. It is usually held that there is a probability of a physical lesion if the vestibular reactions are greatly diminished, but that the deafness is functional when these are approximately normal. True *hysterical deafness* is uncommon; it may be suspected when responses to testing are anomalous and, though it is curable, it may prove very obstinate. *Senile deafness* is a degeneration of the internal ear, characterised by relatively greater loss of the high notes, and of sharp sounds, such as the tick of a watch, compared with the continuous tone of a tuning-fork; it may begin prematurely at any age over fifty, especially in males. All deafness in old people is not, however, necessarily due to their age; they may suffer, like others, from cerumen or Eustachian catarrh, amenable to treatment.

Hearing Aids

Hearing aids have a bearing on prognosis in that they make conversation possible for many sufferers

from advanced deafness. Those with middle-ear deafness can always be helped by such means so long as secondary degeneration of the cochlea is not serious; hearing aids are therefore most useful to patients with middle-ear deafness, especially otosclerosis, who have good bone-conduction, and for them the more recently introduced electric aids with bone-conduction receivers are particularly suitable. It is generally possible to tell these patients that they will remain able to hear conversation by

means of a suitable apparatus. On the other hand, severe tinnitus is apt to be made worse by the use of electric aids, and these are in general less suited to patients with senile deafness than is some form of trumpet or, for the severest forms, the old-fashioned conversation-tube.

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SPECIAL ARTICLES

TRACHOMATOUS CONJUNCTIVITIS ITS SURGERY AND PATHOLOGY*

BY A. F. MACCALLAN, C.B.E., M.D. Camb.,

F.R.C.S. Eng.

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DURING the last thirty years trachoma has become a comparatively rare disease in London. Ophthalmologists can realise with difficulty that the stigmata of the disease are borne by as many as half the inhabitants of the globe. For it is practically universal among the Mongolian and Semitic races, and among the Red Indian tribes; it is also widely spread among the Caucasians of India, and among the Malaysians. Nevertheless, our knowledge of the aetiology of trachoma is incomplete; the clinical diagnosis may be impossible in the absence of bulky and expensive apparatus, and no aids are to be obtained by means of chemical or microscopical tests; while the treatment has not improved during the last thirty years.

Pathological Anatomy

The response to attack by the virus of trachoma is a generalised flooding of the subepithelial tissue of the conjunctiva with lymphocytic cells. Typically, there are in addition special aggregations of these cells, which have been called follicles; however, in some cases no such follicles are to be differentiated from the general exudate of lymphocytes (Mikhail). The follicles, when present, differ in no way from similar aggregations of cells which appear in the condition known as follicular conjunctivitis. The conjunctival epithelium first proliferates, and then becomes villous; or it ulcerates and becomes replaced by scar-tissue epithelium.

The numerous underlying sebaceous or meibomian glands are at first affected by simple blockage of ducts and dilatation, the result of pressure by the cellular infiltration. Later the ducts become strangulated by the developing connective tissue, which begins to take the place of the lymphocytic exudate. The result is the appearance on the surface of the conjunctiva of numerous bleb-like excrescences, which burst on pressure, giving vent to gelatinous matter, the retained secretion of the sebaceous glands, with numerous cells. These bleb-like excrescences by all trachomatologists up to the present time have been looked upon as the follicles, described above, which have become dilated. There is no evidence that such dilatation occurs, nor has anyone ever observed such a phenomenon to develop. It

would be impossible for such a metamorphosis of the follicles to occur. Mikhail also has observed the dilatations of the ducts of the meibomian glands, but has not connected them with the bleb-like excrescences of the second stage of trachoma.

The whole process, for the description of which I am indebted to Pulvertaft, is a chronic progressive inflammatory change, almost certainly due to a secondary infection of the subepithelial tissues, following a primary epithelial lesion. The difference between other forms of conjunctivitis and trachoma is that the effect of the virus is much more lasting in trachoma, leading to this enormous subepithelial exudate, which penetrates to the tarsus, and via the fornical conjunctiva to the upper corneal limbus. The natural end of this severe exudate is its transformation into cicatricial tissue, thereby differentiating trachoma from other forms of conjunctivitis. The involvement of the tarsus in the cellular exudate, and the subsequent cicatrization which occurs, leads to thickening of this boat-shaped structure, and so to entropion. The trichiasis which accompanies the entropion is due to the development of supernumerary lashes by offshoots from existing hair follicles. This new development is caused by the hyperæmic condition of the lid margin which always occurs in serious cases of trachoma.

The hypertrophy of the superficial conjunctival epithelium leads to the appearance of numerous polygonal areas, which form a papillary hypertrophy. This is the result of irritation and is present in all forms of long-continued inflammation of the conjunctiva.

PANNUS

The term pannus was originally applied to the cloth-like opacity which the cornea of an inveterate case of trachoma exhibited. Completely ignorant of the pathology of the disease the surgeons of a former day used to attempt its removal. We now understand the term pannus to apply to an infiltration of the clear cornea by a cellular exudate, which is accompanied by the vascularisation of a previously avascular tissue. This may be observable only by optical magnification, or may be obvious to the naked eye. Following the primary epithelial lesion of the conjunctiva by the trachoma virus, whatever its nature may be, there is an infection of the subepithelial tissues to which response is made by a widespread inflammatory exudation. This spreads from the site of origin, near the retrotarsal fold, to the fornix, travelling beneath the epithelium, and from the fornix proceeds to the upper part of the limbus of the cornea. In this area pannus appears, which in early trachoma is the only pathognomonic sign of the disease.

Mikhail has made it quite clear that the changes at the upper corneal limbus occur in this way, and

* Abstract of a Hunterian lecture delivered at the Royal College of Surgeons of England on Jan. 17th, 1936.

cannot therefore be exercised in endeavouring to achieve this end.

General Principles of Bacteriological Grading

Since the taking of representative samples is difficult, since the results of any one sample are affected largely by the time-temperature conditions under which it is taken and held, and since atmospheric temperature plays a very important part in determining the number of bacteria present, it is concluded that the cleanliness of the milk of any given producer should be judged, not on the basis of one or two samples taken at some particular season, but on samples taken frequently and regularly throughout the year. Whatever test is used, separate standards should be laid down for summer and winter, and penalisation should not be practised so long as a given proportion of samples, such as 75 per cent., conform to these standards. What is required, therefore, for the routine bacteriological grading of milk is a simple inexpensive test, with a small experimental error, which can be used on a large scale by relatively unskilled workers.

Bearing these general principles in mind, it is concluded that, though undoubtedly of use for certain special purposes, neither the sediment test, the leucocyte count, the titratable acidity, the H-ion concentration, the increase in acidity, the bromthymol blue test, the keeping quality test, nor the laboratory pasteurisation test can be regarded as suitable for the routine grading of milk.

THE COLIFORM TEST

None of the three premises on which the use of this test for the control of water-supplies is based holds good for milk. With the possible exception of its employment on empirical grounds for Certified milk, there seems, therefore, to be no justification for the use of either the coliform test or the *coli-aerogenes* ratio test in the grading of raw milk.

For pasteurised milk, on the other hand, the coliform test may be of some value. It may serve as an index of the efficiency of the processing, if performed on freshly pasteurised milk, or as an index of the subsequent contamination or exposure to unsuitable temperatures, if performed on the bottled milk at the time of delivery to the consumer. The experimental error of the test is, however, very large, and on this account the results should preferably be reported, not in absolute numbers, but as above or below an arbitrary standard.

THE BREED SMEAR METHOD

This method has not received in this country the attention it deserves. It is in the rapid grading of milk that the method finds its greatest value. There is no other test that enables a differentiation between clean and dirty milks to be made so rapidly—within a few minutes—and the test is, therefore, of inestimable service at collecting stations where milk from individual farms is bulked preparatory to dispatch to the large towns in rail or road tanks. The test is of considerable assistance to farm inspectors and agricultural advisers, because it so frequently enables a distinction to be drawn between the various faults of production to which any given milk is subject. It can be used as a control to the plate count, or as a substitute for it. As a general test, however, for the routine examination of large numbers of milks, the Breed smear method is, we believe, less suitable than the modified methylene-blue reduction test that we have described.

THE PLATE COUNT TEST

Ostensibly this test measures the numbers of bacteria in milk, but in fact it does not. On account of the difference between various species of bacteria in their nutritional, respiratory, and temperature requirements, on account of the fact that many organisms may be dead, and most important of all on account of the gross irregu-

larity in the distribution and clumping of the organisms in the milk, the plate count merely registers the number of bacterial units capable of multiplying under the particular conditions selected. Since the average number of bacteria per clump is variable from one milk to another, and from time to time in the same milk, and since these clumps may disintegrate to a quite uncontrollable extent during the process of dilution, it follows that the figures yielded by the plate count are arbitrary, not strictly comparable from milk to milk, merely approximate, and have no real significance.

The technique is complex, is difficult to standardise, and requires highly skilled workers. Even under favourable conditions, with the method standardised as far as possible, the experimental error is very large, and on any one count an allowance of ± 90 per cent. may have to be made. Even this margin of error will not include all results. Besides demanding costly apparatus and a delay of at least two days in the result, the plate count seems to afford no better index of the sanitary conditions of production or of the keeping quality of the milk than the Breed test or the modified methylene-blue test. It is therefore recommended that the plate count test should be discontinued as a method of grading ordinary raw milk. Even for Certified milk it seems to have no advantage over the modified methylene-blue reduction test.

The quantitative expression of the results in figures extending over a wide range affords a fictitious appearance of accuracy which leads, not only in laymen, but even in public health officials, to a wholly unjustifiable feeling of confidence in their value. If the plate count is to be used, it should be permitted only on one condition—namely, that the results are reported not in quantitative terms, which are often grossly misleading, but as above or below an arbitrary standard.

For pasteurised milk, with the possible exception of Grade A pasteurised, the plate count is not recommended. The actual count on pasteurised milk is determined by so many factors independent of the efficiency of the processing that the results bear little relation to any important quality of the milk.

THE MODIFIED METHYLENE-BLUE REDUCTION TEST

This test seems to fulfil most of the requirements demanded of a test for the routine grading of raw milk. It is a simple inexpensive test, with a very small experimental error, which can be carried out by relatively unskilled workers on large numbers of samples, which demands a minimum of equipment, which can classify milk on the basis of cleanliness into the maximum number of grades desirable, and which affords on the whole a very good index of the keeping quality of the milk. Besides these advantages, it gives more information about the milk than does the plate count. The result does not appear to be seriously affected by the degree of aggregation of the organisms in the milk, and the test is a very much more sensitive index than the plate count of bacterial growth. By the use of the modified methylene-blue reduction test it should be possible to examine the milk of every farmer at weekly or fortnightly intervals throughout the year at a cost only a fraction of that of the plate count.

Whether the test is suitable for the examination of freshly pasteurised milk is doubtful, but there is reason to believe that it could well replace the plate count on bottled samples delivered to the consumer.

Recommendation

Whatever test is used, the report recommends that no attempt should be made to divide milk into more than three or four classes. The numbers and activity of micro-organisms in milk are determined by so many different factors that the establishment of numerous subdivisions is not only meaningless, but may be definitely misleading. From the public health point of view probably only two divisions need be made on the basis of cleanliness—namely, into (a) milk that is suitable and (b) milk that is not suitable for human consumption in the liquid state.

After consultation with the Ministry of Health the Medical Research Council has accepted Prof. Wilson's report as a statement of the scientific evidence on which possible administrative action may be based.

MORTALITY FROM PHTHISIS IN YOUNG ADULTS

A STATISTICAL STUDY

THE Registrar-General's mortality statistics for recent years have revealed an unfavourable trend in the death-rate from respiratory tuberculosis at young adult ages. In the enormous decline that took place in the death-rate from this cause during the latter half of the nineteenth century young adults had their full share, or even somewhat more than their full share. But between 1901-10 and 1930 the mortality at these ages has declined amongst males at a slower rate than is apparent in any other age-group, while amongst females there has actually been a slight rise in mortality at ages 15-25, and at ages 25-35 the decline has been appreciably less than that observed in any other age-group. Division of England and Wales into its administrative areas shows that it is in the highly urbanised areas that this unfavourable change is most apparent.

The basic figures illustrating this trend were set out in a paper read before the Royal Statistical Society on Jan. 21st by Mr. A. Bradford Hill, D.Sc., in which the author discussed various explanations of the present position. Some workers—e.g., F. J. H. Coutts—believe that the prodigious fall in the general death-rate from tuberculosis has led to a much lower level of infection in early life and this to a decline of immunisation in childhood, with the result that more persons must face the hazards of adolescent life with no acquired immunity. A more frequently accepted explanation attributes the relatively high mortality, especially of young adult females, to the entry of such persons into the "strain and stress of competitive wage earning," with the associated changes in their social life. Dr. Hill is unable to find much statistical support for either of these two hypotheses. Taking the death-rate from tuberculosis at ages 0-5 as a measure of the pressure of infection in childhood, he finds that the course of this death-rate in a group of English counties is not related to changes in the mortality experienced at young adult ages in later years. Similarly, towns with a high death-rate from tuberculosis at ages 0-5 do not appear to have a lower phthisis death-rate in young adult life fifteen to twenty years later than towns with a relatively low death-rate in childhood—general health factors being as far as possible equalised. With regard to occupational changes Dr. Hill shows first that in towns where the death-rate of young adult females has shown the greatest increase, there has been, on the average, a tendency for the rate of young adult males to increase also, or to show a slower rate of decline than in other towns. Where the female rate has declined substantially the male rate has also, on the average, declined substantially. Dr. Hill argues that this relationship implies a causal factor common to both sexes and suggests that the occupational changes in female life are therefore unlikely to be more than a partial explanation. He finds no correlation between changes in the volume of female employment over the years 1911 to 1931 and changes in the phthisis death-rate of young

adult females in the county boroughs. The changes in *type* of employment evident in recent years are more difficult to measure but the evidence available does not implicate such changes as a responsible agent.

Failing to find support for these explanations Dr. Hill turns his attention to the question of internal migration and the consequent distribution of young adults in different parts of the country. In past years one striking aspect of the phthisis mortality of young adults in this country has been the *higher* death-rates registered in the rural areas as compared with the urban areas, a phenomenon observed only at these ages. In an investigation carried out by the author some years ago,¹ he concluded that the explanation of this position lay in the migration of young adults from the country to the town, and that the migrants form a physically select group, which strengthens the town population at young adult ages and leaves a physically weaker residue behind. It follows that changes in the volume of this migration would be expected to produce changes in the regional distribution of the phthisis death-rate. In fact, in recent years the excess mortality at the young adult ages in the rural areas has completely disappeared. At the same time the loss of population in the rural areas has turned to a gain. The rural exodus slackened at about the turn of the century, while, in addition, the population of many rural areas may have changed in type due to the improved methods of transport enabling persons to reside in such areas and work elsewhere. Similarly the migrants to towns may have changed in type—for instance, it appears that London tends now to recruit young adults from the depressed areas rather than from the rural areas. Are these changes in the movement of population related to the changes in the phthisis death-rate? Dr. Hill finds that, to some extent, they are. Those county boroughs which have attracted young adults have, on the average, shown a declining death-rate from phthisis in young adult life during the past decade, while those that have lost population have tended to show a rising death-rate. This association might, the author suggests, be due to the fact that towns that have ceased to attract population are in a less satisfactory economic position than those that still recruit young adults, and this lower economic level is reflected in their death-rates. Alternatively it may be that, in towns that are no longer recruiting physically fit young adults from the rural districts, the death-rate is now measured upon a physically different population from that of past years. The towns are no longer strengthened, or are less strengthened, by this selective recruitment, the rural areas are less depleted.

Naturally, as we are dealing with a general phenomenon, Dr. Hill does not put this forward as being more than a contributory factor. In the recently issued text volume of the Registrar-General's Statistical Review for 1933, attention is directed to the association of increasing mortality at young adult ages with unfavourable housing standards.

"Grouping together areas with over 1 per room average density, phthisis mortality of females aged 15-25 increased from 1911 to 1930-32 by 25 per cent. in the county boroughs and 21 per cent. in the counties, whilst in London with a mean density about 1 per room it increased by 16 per cent. At densities of 0.85-1 per room the towns showed no change and the counties an increase of

¹ Med. Research Coun., Spec. Rep. Series No. 95, London, 1925.

15 per cent., but at densities below 0.85 per room both showed improvement of the order of 20 per cent. On the other hand, at ages 25-45, the fall in mortality was not confined to the better housed areas, but occurred almost irrespective of density."

It will be realised that the problem is intricate and its solution involves, as a first step, the clear presentation and careful analysis of statistical data. Dr. Hill's paper is a model of such work and will be indispensable in further study.

THE ARMY IN 1934

THE Report¹ of the Director-General of Army Medical Services for 1934 makes cheerful reading. Soldiering in that year was an even healthier occupation than in 1932, previously a record year. The ratio of admissions to hospital fell to 402.6 per thousand compared with 412.5 per thousand in 1932, and there were appreciable reductions in the death, invaliding, and constantly sick ratios. The most notable decrease in disease was that of the malaria-rate in India which fell to 67.5 per thousand.

Among officers the admission-rate was 191, a slight increase on 1932. The most important causes of illness were, in order, inflammation of areolar tissues and tonsils, fractures, dysentery, malaria, influenza, and appendicitis. The principal causes of admission to hospital were the same for the soldier as for the officer, except that for the soldier venereal disease appears in the third place while dysentery and appendicitis were less common than sprains, contusions, and inflammations of the upper respiratory tract. Bacillary dysentery is now about five times as frequent as amoebic—a marked contrast to the position ten years ago. Treatment is very satisfactory; only three patients were invalided from the Service during the year. There has been a striking decrease in the enteric group of fevers, especially in India. Arrangements are being made to extend protective inoculation to children, among whom the incidence is still too high. Improved figures in India are also responsible for a general reduction in sand-fly fever. There has been a general decrease in venereal disease, except in Jamaica. Work on the treatment of gonorrhœa tends towards substituting saline irrigation fluids for potassium permanganate. Specific infectious fevers were rather bad during 1934 and there were three deaths from diphtheria and two from scarlet fever. General immunisation of children at Black-down may have accounted for the complete absence of diphtheria on that station, and vigorous steps are being taken to spread this form of protection. The large increase of cerebro-spinal meningitis in the Indian civil population has not so far affected the troops. There was a high incidence of middle-ear disease in Jamaica, Malaya, and Egypt, probably associated with the fact that bathing is a chief recreation in these places. The reduction of tonsillitis is deemed to be of the utmost importance because heart disease of rheumatic origin is the cause of much wastage.

There has been a steady increase during the past 11 years in gastric and duodenal ulceration, and a smaller increase of appendicitis. The figures are believed to depend on improved diagnosis rather than on any real increase. There has been no change in the standard diet, but the ætiological factor of dental sepsis is under increasingly better control.

Young unmarried soldiers with ulcers which relapse twice after adequate medical treatment are being recommended for discharge. It is felt that young soldiers are liable at any time to military duties which may, and often do, nullify in a few days the results of the most careful treatment. Few of the factors important in maintaining freedom from ulceration are within the control of the individual soldiers themselves. While the best possible diet and cooking are provided, the men cannot always be kept from sudden exposure to fatigue or inclement weather or obtain, out of hospital, frequent regular meals specially adapted to their needs. Married non-commissioned officers of long service suffering from ulcer are, if possible, retained and the commissioned officers—apart from mobilisation or prolonged manœuvres—are in a more hopeful position.

The typhus group of fevers is attracting special attention abroad and evidence is accumulating to show that in India there are several hitherto unrecognised sub-groups with differing serological attributes.

SURGERY

There was an increase in the number of surgical operations performed during the year, the total being 9157, with a mortality-rate of 0.54 per cent. This includes pensioners and women and children. The chief facts that stand out from the Report are the importance of local injuries and diseases of the areolar tissues—notably boils and carbuncles. The latter are treated conservatively with magnesium sulphate compresses rather than by active interference. There is also a tendency to give up open operations on fractures and to rely more on skeletal traction by wire or pins. Local anæsthetics are more widely used for setting fractures. The use of spinal anæsthetics and Evipan is on the increase, although inhalants are still by far the most popular. The commonest major operations, apart from hernia, appendicitis, and ulcer, were cholecystectomy and for intestinal obstruction. There were 349 operations for recent inguinal hernia and 8 for femoral hernia. Injuries of the knee-joint played a fairly large part in disability and in 36 cases the fluid was aspirated; the time spent in hospital was considerably less than if the cases were treated by elastic pressure and conservative measures. "Out-patients" forms a very important part of the work of the surgical specialist, and clinics for the injection treatment of varicose veins and hæmorrhoids continue to be of great value. There has been a large increase in the work of radiological, massage, and electrotherapeutic departments.

WOMEN AND CHILDREN

There was an average strength of 18,508 women for which the Army Medical Department provided services during 1934, and of these over 3000 were admitted to hospital during the year. The principal causes of admission were abortion, cramp and spurious labour pains, malaria, and appendicitis, followed in frequency by inflammation of the tonsils, bronchi, and areolar tissue. In addition, 2660 women were admitted to hospital for confinement and 13,845 received out-patient treatment. Of the 29,521 children on the roll there were just over 5000 admissions to hospital and 26,847 out-patients. The principal causes of admission were enlargement of the tonsils, scarlet fever, inflammation of bronchi and tonsils, pneumonia and measles, dysentery, diarrhœa, malaria, and inflammation of areolar tissue. The wives and children are not entitled to medical

¹ Report on the Health of the Army, 1934. H.M. Stationery Office. Vol. lxx. 1p. 165. 3s.

attendance at public expense but are eligible for it under certain conditions. Military family hospitals are established at stations where the strength of the garrison is out of proportion to that of the civil population. All these hospitals have antenatal clinics and during 1934 more than 300 expectant mothers were admitted for observation and treatment. The percentage of abnormal labours was very small; the morbidity-rate was less than 8 per cent. and the mortality-rate 0.3 per cent. Authority is being sought for the extension of facilities for dental work by the Army Dental Service to all expectant mothers. An increasing interest is being taken in mother and child welfare, and accommodation is becoming cramped, but neither authority nor funds exist at present for new construction.

The Report emphasises the immense value of the work of the nurses of the Soldiers', Sailors', and Airmen's Families' Association. As an example, in Egypt seven nurses are employed, and they paid just under 40,000 visits during the year and gave an average of 514 hours' work each to welfare centres and medical inspection rooms. During the autumn a general supply of milk was instituted for children attending army schools in the Southern Command. Unfortunately there was some doubt for a time whether the Milk Marketing Board's scheme was applicable to army schools, but the hope is expressed that it will soon be possible to continue the sale of milk at reduced rates. In the Aldershot Command a manufacturing firm has offered to supply a third of a pint of malted milk for each child at a cost of 3d. a week. Fresh milk-supplies remain variable and only partly under control.

Most barracks in Egypt are very heavily infested with bugs, and an experimental disinfestation with hydrocyanic gas proved to be extremely satisfactory.

Research work has been continued on the effects of a new type of deep breathing exercises on the vital capacity of the lungs. The average gains of platoons on these exercises was 130 c.cm. greater than the gain of those on ordinary exercises. The research department of the Directorate of Pathology has been concerned with the production of a better typhoid vaccine. The demonstration that a typhoid septicaemia could be induced in mice, which could also be rendered more or less immune by vaccination, offered a new avenue of approach to the problem. It was found possible to enhance the virulence of different strains and the corresponding vaccine by continued and rapid animal passage. A similar procedure was followed for the paratyphoid organism, and it is confidently expected that vaccines prepared from the highly virulent cultures will be as superior in human prophylaxis as they are for laboratory animals; they were first used just before the trooping season of the year under review. Although inoculation is entirely voluntary, 98 per cent. of the troops availed themselves of it. Children from the age of 2 years upward tolerate the vaccine well.

The rate of rejection of the troops was nearly 40 per thousand lower than in 1932-33. It is hoped in future to maintain statistical records of those rejected at sight by the recruiting staff without medical examination, in order to obtain a true picture of the physical state of the youth of the nation. In the London zone it is known that 1749 were rejected for obvious physical defects, making a percentage of 67.2. Of those medically examined, the figure for the whole army is 35.7 per cent. rejected for medical reasons. The total would therefore appear to be approximately 50 per cent. of those applying.

MEDICINE AND THE LAW

Lightning and Workmen's Compensation

THE risks of injury due to the weather have raised interesting questions under the Workmen's Compensation Acts. If the workman is to recover compensation, his injury must have arisen not only in the course of his employment but also out of his employment. To be struck by lightning while at work is an injury arising in the course of the employment; it is not necessarily an injury arising out of the employment. The leading authorities include cases of bricklayers struck by lightning when on a high scaffolding, or sailors affected by heatstroke while painting the ironwork of a ship in the heat of a tropical sun. A recent decision in the Bath county court illustrates the legal issue. A workman died while employed on the Bath corporation's housing estate where a trench was being dug for the laying of iron water-pipes. On June 25th there was a violent thunderstorm and work proceeded at intervals. The dead man had a steel shovel with a wooden handle in his hand and was stooping to throw soil forward, with the shovel slightly raised. A second man was similarly employed within a few inches of him; a third was a few feet away. A wooden wheelbarrow was a few yards off; it had a steel rim to the wheel. Suddenly the deceased was thrown on to his back on the ground; there was a loud clap of thunder and a vivid flash; a neighbouring workman complained of shock. The county court judge was offered a large body of scientific evidence as to the effect of the wheelbarrow, the shovel, the pipe line, and the stacked pipes. He rejected this evidence as largely speculative and partly incredible. He came to the conclusion that the deceased, who had been badly burned, was directly struck by the lightning and that the electric discharge had not been attracted or conducted by the metal objects named. The parties agreed that the court had to decide whether the deceased, by reason of his occupation, was subject to a greater risk than usual. The judge found that there was nothing in the man's employment which added to the risk of his being struck. The deceased was in no greater peril than any other inhabitant in the city of Bath or immediate neighbourhood. The court was satisfied that the lightning which killed the workman had no kind of connexion, direct or indirect, with his employment. There was thus an award for the respondents, the Bath corporation, with costs. It is a pity that the experts' evidence was not more fully reported. What, one wonders, are the professional qualifications most acceptable to a court in expert witnesses who are to deal with the effects of lightning?

"Running Amok" with a Car

THE unsuccessful appeal in *R. v. Mortimer*, against a conviction for murder, disclosed strange facts and a neat point of criminal law. The accused stole a car at Aldershot and, next day, drove it along a lane where two sisters were riding their bicycles in single file ahead of him. Approaching them from behind, the car struck the rearmost cyclist and carried her and her bicycle along the road for about 30 yards on the bonnet. The woman then fell to the ground, dying later of her injuries, and the car drove on and disappeared.

In ordinary human affairs knowledge of a man's previous conduct and character is the first thing taken into account. If money has been stolen in

an office, a business man would at once suspect that a clerk who had been previously convicted of larceny had been the thief. The law carefully excludes such extraneous considerations. If a man is charged with theft, the prosecution is not entitled to offer evidence (except in certain carefully restricted contingencies) that the accused stole something else on some date earlier or later. One of the grounds for offering evidence of similar offences is the existence of a need to negative the idea of accident. In Mortimer's case the prosecution, having to prove that he intended either to kill or to cause grievous bodily harm, obtained permission at the trial to give evidence of three similar occurrences (two earlier, and one later, than the event which formed the subject of the present charge) in order to establish the intent and to negative the possibility that the event was an accident. The Court of Criminal Appeal decided on Jan. 13th that this parallel evidence was rightly admitted.

The defence in a case of this kind is naturally at a disadvantage if it takes two different lines. Mortimer's counsel relied on certain discrepancies in the evidence as to the number of the car and the clothing worn by the appellant. It would probably occur to the average reader to say that a man must be mad who acts as Mortimer was proved to have acted. Insanity was not pleaded, but it remains to be seen whether this may not be one of the cases where the accused, though deemed sane enough to be convicted of murder, is deemed not sane enough to be hanged.

Marriage of Girl under 16

One of the first cases under the Age of Marriage Act, 1929, was heard in the Probate, Divorce and Admiralty Division last week. A woman who was married on Sept. 27th, 1930, after giving her age in the marriage register as 17, now petitioned for a declaration that the marriage was null and void because she was in fact one month short of 16 years of age at the time. The court granted the declaration invalidating the marriage.

Food Preservative Prosecution

Three companies were fined last week at Tower Bridge Police-court, on proceedings at the instance of the Bermondsey borough council, for the sale of "Drywite Potato Preparation" in contravention of the Public Health (Preservatives, &c., in Food) Regulations. The proceedings raised the issue whether the language of the label would be likely to lead to an offence inasmuch as the preparation contained sulphur dioxide. It was stated that the label made reference to the washing but not to the cooking of fish; the preparation was described as a powerful deodorant. Experiments were said to have shown that, if fish were fried after treatment with the preparation, or were washed whole, no sulphur dioxide was found; but that when fillets of cod were washed in the preparation and analysed without cooking sulphur dioxide was revealed in minute quantities. The significance of the matter, it was suggested, lay not in the quantity of the preservative but in the fact that its use might lead to the consumption of unwholesome fish, since the preparation was capable of masking the evidence of putrefaction by removing smell or otherwise. For the defendant companies it was admitted that, in view of the statements made by the prosecution, the label might lead to the sale of uncooked fish containing prohibited preservative. A formal plea of guilty was entered and the companies undertook to discontinue the use

of the offending label. Fines were inflicted with costs. A further summons for failure to label the preparation as prescribed by the regulations was not separately dealt with; this part of the case related to the allegation that the declaration of the contents of the preparation was printed in type of smaller size than prescribed.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

X RAY EXAMINATION OF THE GASTRO- INTESTINAL TRACT

Dr. Robert McWhirter, who was recently appointed radiologist to Edinburgh Royal Infirmary, read a paper to the Medico-Chirurgical Society of Edinburgh last week on the examination of the gastrointestinal tract by radiology. He said that while in the early days of X raying the stomach only gross lesions were detected, modern apparatus and technique have enabled a very high degree of accuracy to be obtained in the diagnosis of diseases of the stomach and duodenum. The figures from the Mayo Clinic suggest that the degree of accuracy should be over 95 per cent.; this, however, is only possible with careful preparation of the patient and modern apparatus. While some radiologists like to have a full clinical history of the case before examination, Dr. McWhirter holds that no case notes should be supplied to the radiologist, in order that he may not be prejudiced by a clinical history. He proceeded to describe conditions of the œsophagus, stomach, and duodenum which can be diagnosed by X ray examination. In diseases of the stomach the preparation of the patient is simple but very important. No fluid or food should be given from 10 P.M. the night before examination. No purgatives are necessary. It should be possible, he said, to detect an ulcer crater the size of a pin-head and a carcinoma the size of a thumb-nail. Clinicians do not fully appreciate the fact that the diagnosis of diseases of the stomach and duodenum is made by screen examination alone and films are taken only for record purposes. The study of the mucous membrane pattern is of special importance in the detection of early diseases of the stomach. The presence of a residue in the barium in the stomach five hours after administration is often of no pathological significance. The diagnosis of pyloric stenosis can be made in five minutes on screen examination. In cases of duodenal ulcer the finding of the actual ulcer crater is always evidence of active ulceration; when only ulcer deformity is present the appearance may be due entirely to a healed ulcer. Dr. McWhirter went on to say that in his opinion the diagnosis of chronic appendicitis by radiology was impossible, and that a large amount of time and money was uselessly expended in attempting to demonstrate chronic diseases of the appendix. After considering the diagnosis of diseases of the large intestine and emphasising the importance of careful preparation for this examination, Dr. McWhirter referred to the examination of the gall-bladder by X rays. He said that intravenous injection of the dye used was no longer necessary, and emphasised the fact that the administration of the fatty meal was not to demonstrate the contractility but to make more obvious negative shadows within the gall-bladder. Dr. McWhirter's communication was illustrated by beautiful X ray photographs.

A PHYSIOLOGIST ON MEDICAL EDUCATION

Prof. E. W. H. Cruickshank, who has been appointed to the Chair of Physiology in Aberdeen University, delivered last week his inaugural lecture entitled *Some Views on Medical Education*. He said that the first purpose of medical education was to turn out men well equipped in the art and practice of medicine in all its phases; and the second was to discover and train men in creative work. He emphasised the need for general cultural education as an introduction to medical studies. The rigid lecture system had led to the evil of elaborate note-taking by the students and should as far as possible be replaced by the conference method, which, if carried out in small groups, was valuable in training the student in critical inquiry and in arriving at reasoned conclusions.

THE "OPEN-DOOR" POLICY

The abuse of the "open-door" policy has led the Board of the Royal Infirmary, Glasgow, to make use of its almoner's department for the purpose of giving patients who are able to pay the opportunity of contributing to the cost of their treatment. In so doing they are taking the step which the other large voluntary hospitals in Scotland will probably have to follow before long. The steady increase in the work done by the voluntary hospitals and the fact that all classes are going to make use of the treatment and advice that can be obtained in these hospitals will, in all probability, oblige them to make a charge to those who are able to pay.

UNITED STATES OF AMERICA

(FROM AN OCCASIONAL CORRESPONDENT)

CONTROL OF PATENT MEDICINES

THE seventy-fourth Congress now reassembling after its vacation has before it no less than nine bills for the better regulation of the manufacture, advertisement, and sale of foods, drugs, therapeutic devices, and cosmetics. The most important of these is Senate Bill No. 5 introduced by Senator Copeland, of New York, who is a physician. This is described as—

"An Act to prevent the adulteration, misbranding and false advertising of food, drugs, devices and cosmetics in interstate, foreign and other commerce subject to the jurisdiction of the United States, for the purposes of safeguarding the public health, preventing deceit upon the purchasing public and for other purposes."

The bill has been critically analysed by the Bureau of Legal Medicine of the American Medical Association, who find that "there is grave danger of the enactment of an inadequate law—one that will not protect the consumer adequately, that will require expensive and prolonged litigation before it can be effectively enforced, and that may for another quarter century or more exclude from the statute books an effective law." The influence of the lobbies representing the cults is very obvious, and may well serve as a horrible example to English legislators. Thus "Drugs" as defined in the Copeland bill are so defined specifically for the purposes of this act and "not for the regulation of the legalised practice of the healing art." Why on earth not? one might reasonably ask. The only possible answer seems to be that certain State laws allow chiropractors to make adjustments but not to use drugs. Somebody seems to have been afraid that the Copeland bill by its definition of drugs might help to convict a chiropractor

of using drugs contrary to the statute of his particular State. The answer to the question *When is a drug not a drug?* will no doubt contribute to the cost of the "expensive litigation" referred to by the committee.

Again, "medical opinion" is defined as "the opinion within their respective fields of any branch of the medical profession the practice of which is licensed by law . . ." and the term "medical profession" means, despite appearances, "the legalised professions of the healing art." What becomes, then, of the bill's prohibition of false advertisements, seeing that the advertiser has adequate defence if only he can show that his statements are supported by "substantial and reliable medical opinion"? Presumably most juries will accept as such opinion, and will be instructed to accept it, the evidence of any half a dozen naturopaths. These and other weaknesses in the descriptive provisions of the bill are not offset by any rigidity in the provisions for enforcement. On the contrary the Secretary of Agriculture is expressly excused from prosecuting any "minor violations" if he thinks a "written notice or warning" is to be preferred. Considering that no guidance is offered as to what constitutes a "major" and what a "minor" violation, and that in practice the decision of whether or not to prosecute will inevitably devolve upon subordinates, the weakness of this provision is apparent.

The analysis by the American Medical Association will serve a useful purpose if it leads to correspondence between individual doctors or local societies and their representatives in Congress. It has not received and is unlikely to receive any notice in the lay press. Discussion of the provisions of the bill controlling advertisement, and of their present weakness, is not likely to be favoured by the powerful advertising interests.

BUDAPEST

(FROM OUR OWN CORRESPONDENT)

UNEMPLOYED DOCTORS IN BARRACKS

At the request of the National Committee for Unemployed Graduates, the Ministry of Defence has provided shelter and board for 100 of these men, most of them doctors. They live in a vacant military barracks, in dormitories of 5-15 beds, with no other furniture than a long trestle table and benches and chairs. Clothes and linen are kept in bags, and shelves for books have been placed over some of the beds by the men themselves. Here they live in true good fellowship, without jealousy or discontent, and the only disputes are on scientific subjects. They themselves arrange the day's routine and discipline, which are scrupulously observed. In the morning after breakfast they scatter through the city in search of work. At noon they return to the barracks and after a simple meal they do domestic work. Needle and thread are taken out, and the hands trained to do operations now display great skill in repairing a solution of continuity in coat, shirt, or trousers. Some, lacking means to pay the shoemakers, show themselves able to sole and heel their boots. After further search for work they return early in the evening, having no money to spend in clubs, cafés, or music-halls. In this way the days and weeks are passed until some fortunate runs in, joyfully shouting that he has found a post as an assistant or parish doctor or in the health

insurance service. Hurriedly packing his bag he leaves his place to another of the unemployed, of whom the numbers are woefully great. There are no complaints, despite the contrast of barrack room and military food with their hopes when they qualified—hopes of appointments, assured status, marriage, and family life. Most of them are young and expect sooner or later to get work and realise their dreams; the barrack-room life is only a transitory stage and in the end the majority find satisfactory work.

THE ELDERLY PRIMIPARA

During the past 24 years Dr. Stephan Sztehlo, of the School of Midwifery here, has personally observed 5588 deliveries of primiparæ and has now reviewed them in order to determine the effect of age on labour. His findings agree with the general opinion of obstetricians that the influence of age is considerable. After thirty, a first labour is likely to be more troublesome, and one must be prepared for complications—especially in women who have become pregnant for the first time after many years of married life. The risk of long labours, inertia, post-maturity, hæmorrhage, and puerperal sepsis increases with the age of the patient, and from the point of view of pregnancy and labour, he thinks, the most favourable age for labour is 20–24 years.

A RHEUMATISM LIBRARY

In 1926 at Pistany, the thermal spa, the International League for the Campaign against Rheumatism was formed and it was then hoped that an international institute for research into muscular and articular rheumatism might be founded. A leading physician in the town has made plans for such an

institute, and they have been approved by the Ministry of Public Health. A library is the first part of the scheme to be realised and building will begin in February. Its objects are to attract students to Pistany, to offer them facilities for studying the literature, and thus to help research workers in their investigations.

MEAT CONSUMPTION IN HUNGARY

An average of 116 lb. of meat per head was consumed in Hungary in 1934, a figure which cannot be considered low compared with those of other European States. Financial stress caused only a slight decrease in meat consumption because of a simultaneous fall in the price of food, and particularly of meat. As might perhaps be expected, more is eaten in Budapest than in the countryside. Owing to the relative cheapness of beef, veal, and mutton, very little horse-flesh is now eaten, though it was once considered a delicacy.

FREE MILK IN THE SCHOOLS

In the poorer parts of the capital the city council have introduced the free milk system and to every child about a third of a pint is distributed each day. A recent report of Dr. Endre Tudós, lecturer in the university, shows that this distribution has considerably improved the condition of delicate or anæmic children, and the teachers have noticed faster progress, keener attention, and quieter behaviour. The minister of education is accordingly anxious to introduce the system in rural districts, where children badly need wholesome milk because, owing to the economic crisis, the small farmers with a few cows sacrifice their own and their children's health by selling their entire stock of milk to the city.

PUBLIC HEALTH

Maternal Deaths in L.C.C. Hospitals

THE strenuous efforts to improve the L.C.C. maternity services have caused an increased demand for admission and a lowered death-rate affecting almost every group. Dr. Letitia Fairfield,¹ reporting for the year 1934, records a total of 13,253 births, an increase of 1336 on the previous year, and a mortality-rate of 5.1 per thousand. The antenatal care reaches a very high standard. The Council demands one special examination for all booked patients, but the great majority attend more or less regularly at borough clinics. The divided responsibility for maternal care has always created difficulties in London, but there has been a marked improvement in coöperation during the past year. One of the chief difficulties of the Council is congestion, for Wassermann tests are now made on all women attending for the first time, and many more blood pressures are now taken than in earlier days. These precautions are justified by a comparison of the death-rate of those attending L.C.C. clinics with others.

Sepsis.—The mortality figures for the Council's hospitals cannot be compared with the country generally because these institutions are the chief resort for cases of abortion, and they also receive an undue proportion of women suffering from general diseases. They show, however, that sepsis is the commonest single cause of death in the Council's wards, as elsewhere. Deaths from true uterine

sepsis numbered 8 only (0.61 per thousand births), and of these only 5 were patients whose labour had been conducted entirely in the Council's hospital. If deaths after Cæsarean section and mastitis are included, the figure for 1934 is 1.18 per thousand births. There was nothing in the nature of an epidemic during the year, and in only one case of sepsis was there evidence of the source of infection, but the prevalence of mastitis in certain localities continues to give rise to anxiety. Certainly forceps do not appear to be the cause of sepsis in the Council's service. Dr. Fairfield thinks that one of the most important factors in the prevention of sepsis is the early detection and isolation of all cases of fever or other suspicious signs of early sepsis in a maternity ward. Improved accommodation is making this precaution possible in the Council's hospitals, with increasing success.

Apart from sepsis there were 4 "accidents of childbirth": 3 of the patients were admitted in extremis, one with a ruptured uterus and a shoulder presentation and two after "failed forceps." The fourth had had antenatal care from the Council and died from shock after craniotomy.

Accidental hæmorrhage and placenta prævia.—Of the 86 cases of accidental hæmorrhage admitted only 1 died, and she arrived moribund.

There were 98 cases of placenta prævia with 3 deaths, one from sepsis after several vaginal examinations made before admission. 13 Cæsarean sections were performed for placenta prævia without a death.

Anæsthesia.—There was 1 death attributable to anæsthesia: percaïne and a gas, oxygen, and ether

¹ L.C.C. Annual Report of the Council, 1934. Vol. iv., Part III. Public Health. Medical Supplement to the Report on the Hospital Services, p. 88.

mixture. She died five minutes after induction began without warning, before the operation was started, and the heart muscle showed degeneration. Of the 13,061 women delivered 4424 were given light intermittent anæsthesia, mainly by chloroform capsules, 850 had a general anæsthetic, 58 had a local anæsthetic, and 325 had analgesia by drugs in combination with some form of anæsthetic. Analgesia without an anæsthetic was supplied to 837 patients.

Cæsarean section was performed on 136 patients with 9 deaths. In most cases the indication was contracted pelvis and disproportion, but heart disease, placenta prævia, and toxæmia played their part. The operation was performed before labour in 74 cases with 5 deaths, early in labour in 30 cases with 2 deaths, and late in labour in 32 cases with 2 deaths. Four of the deaths were entirely due to the condition for which the operation was performed and the remainder were due to sepsis. Of the first group, one had very severe heart disease, one fulminating acute yellow atrophy of the liver, the third had chorea gravidarum, and the fourth a large pyelonephrosis.

The large strides made in preventing *eclampsia* and *toxæmia* have caused these diseases to be regarded as an indicator of the efficiency of antenatal care. Dr. Fairfield thinks that the argument can be pushed too far as, on the one hand, the patient may fail to recognise early symptoms however carefully she is instructed, or, on the other hand, the disease may be of the rare fulminating type which resists all treatment and gives no warning. During the year 41 cases of *eclampsia* were admitted; 12 had had antenatal care in the Council's clinics and 2 of these died; 29 had had care from other sources (or none) and 6 of these died. The time at which the fits developed illustrates the grave prognostic significance when the first fit is post-partum. In 11 cases the fits began before labour and in 22 cases during labour, and in each group there were 2 deaths. In 8 cases they began after labour, and half these women died. It is clear that periodic urine testing would not always provide an adequate warning: one woman who died never had any albuminuria at all, and in some cases the urine had been tested only a few days before the fits began and had shown nothing abnormal. The blood pressure is a valuable but not an infallible guide to the imminence of danger. Only one woman with *eclampsia* had a pressure below 130. Above this critical figure, however, the readings had little prognostic significance, as patients with a maximum of 140 died while those with pressures of over 200 recovered.

Another group of deaths recorded is that associated with pregnancy and confinement; this includes every woman who died between the twenty-eighth week of pregnancy and four weeks after delivery. Some of the deaths were purely coincident, while in others childbearing played an obvious part. Dr. Fairfield points out that a quite extraneous cause such as an influenza epidemic might easily affect the maternal mortality-rate and create fallacious alarm, while over-careful certification might over-weight the figures. Instances have been known where a woman died from phthisis or heart disease weeks after childbirth and was classified as a "maternal" death.

Dr. Fairfield concludes by remarking that the close inquiries into every maternal death in the Council's hospitals show that no obvious or easily eliminated cause for a high mortality-rate exists.

The only possibility of a further reduction lies in a steady improvement of staffing, accommodation, and organisation, together with loyal coöperation on the part of the patient.

Speech Training and the C.A.M.W.

An increasing number of local education authorities have made provision for the treatment of stammering and other speech defects; at the present time 40 authorities provide classes which children attend for a period of about 50 minutes on two occasions per week, while 10 authorities provide classes where full-time attendance is arranged, but, as is pointed out in the C.M.O.'s recent report, many authorities still do not appreciate that inability to speak distinctly is an even greater reflection on the educational system than is failure to acquire the art of writing. The Central Association for Mental Welfare has, during recent years, arranged for an expert in speech-training to visit certain areas in order to investigate the problem of children with speech defects. Before her visit, ascertainment of the number of such children has been carried out by head teachers and the names of such children sent in to the education office. The speech expert, Miss Marion Fleming, has then examined the children in coöperation with the school medical officer, after which suitable children have been taught in classes arranged on the lines of those which are held in London. In addition to the actual training of children with stammering and other speech defects, Miss Fleming has lectured to teachers and others interested in the problem, given demonstration lessons before teachers from the contributory schools, and she has also paid a number of home visits.

The school medical officer for Coventry has included in his annual report a statement by Miss Fleming of the incidence and histories of stammerers in the Coventry schools. In association with the assistant school medical officer information relating to 158 stammering children was obtained, and the following conclusions were arrived at:—

1. Of the stammerers investigated, 62 per cent. were either the eldest or the eldest but one in the family, while 21.5 per cent. were the youngest members of their respective families; in the larger families containing stammerers, therefore, the incidence of stammering appears to be least among "middle" children.

2. In about one-quarter of the cases, either the father or the mother was also a stammerer.

3. It appears that there is no notable connexion between "left-handedness" and stammering.

4. As expected, findings indicating stammering as a functional nervous disorder were numerous; among them 75 per cent. of the cases were noted as being nervous and "highly-strung"; 22 per cent. of the cases were nail-biters; 62 per cent. of the cases were said to speak more easily at home than at school.

5. In most cases, the cause of the stammer was not evident. The findings under the headings of causation are hardly compatible in some directions with findings under other headings. For instance, "imitation of others" is given as the cause in but 5.7 per cent. of cases, whereas stammering in one or other of the parents, which is likely to elicit imitative response in the child, is recorded as occurring in as many as 22.7 per cent. of the cases investigated.

Miss Fleming only remained for a period of from six weeks to two months in the area. This time, as she points out, is too short for definite results to be obtained in the treatment of stammerers. The great advantage of the arrangement, however, is that local interest was aroused, and in more than one of the areas which she visited it is proposed to appoint a whole-time teacher for children with stammering and speech defects.

CORRESPONDENCE

CONTROL OF MEASLES

To the Editor of THE LANCET

SIR,—Dr. J. D. Rolleston's historical résumé of the subject of the serum prophylaxis of measles in your last issue (p. 168) was of great interest. Stating that Dr. Brincker was incorrect in his belief that the first attempt to modify measles in this way was first made only 40 years ago, he refers to Frances Home's pioneer work on this subject in 1765. He then states that Dr. Hugh Thompson, of Glasgow, employed this method successfully in two cases (1890). I was able to discuss this with the late Sir Leslie Mackenzie just before his death, and he then informed me that Thompson had subsequently published a considerably larger series of cases with similar results. I am unfortunately unable to find any reference to this series, and it would be of considerable interest to hear if any of your readers are able to give information with regard to this.

I believe that I am correct in saying with regard to the modern method of prophylaxis and attenuation of measles by means of convalescent serum that I was the first to introduce it to this country some years prior¹ to the epidemic of 1929-30 in which it was used with such success.

I am, Sir, yours faithfully,

Harley-street, W., Jan. 20th. W. S. C. COPEMAN.

SYNTROPAN IN SEA-SICKNESS

To the Editor of THE LANCET

SIR,—May I draw your attention to the effectiveness of the new synthetic vagus depressor, Syntropan, in sea-sickness. As ship's surgeon travelling between Australia and London, and vice versa, during two very stormy periods, I have had some rather intensive experience. The first trip, homeward bound, in November-December, was made in a severe Mediterranean storm, and a severe Atlantic storm in which the wind reached gale force, as recorded in the ship's log, for the best part of ten days. Conditions aboard ship were at their worst, and most passengers were sick—some exceedingly sick. On the outward journey in July-August, the monsoon was at its height, a man being lost overboard from a sister ship passing us. There were seven days of bad weather and much sickness.

A total of 140 cases of sea-sickness was treated, 100 with Syntropan preparation No. 2190/14, and 40 with Vasano, and with the usual mixture of hyoscyamine and bromide. Syntropan and vasano were equally effective in removing almost instantly the feelings of nausea that precede the sickness. The hyoscyamus mixture was not so effective in ambulatory cases. When vasano was replaced by syntropan, the passengers thereafter preferred the syntropan preparation because it did not give rise to the intensely dry mouth which is also produced by hyoscyamus. Two tablets, morning and afternoon, served to cure the worst cases. The usual difficulty in dealing with patients unable to keep the tablets down was overcome by using suppositories of the same material. Passengers who were occasionally overcome, when given two tablets of the syntropan preparation, were almost immediately restored, so that the efficiency of the preparation became a subject

of comment; one tablet sufficed in mild cases. Moreover, I cured a fellow officer, and myself, just as rapidly, by taking two tablets when the stage of real discomfort had been reached.

Why syntropan should act so effectively on the gastric vagus and have so little action on the salivary parasympathetic supply, is not at all clear; it may be a matter of differential rates of penetration of the drug into the neighbourhood of the various parasympathetic endings that is the explanation. The result, however, is remarkable, and anyone knowing the discomfort of the dry mouth produced by hyoscyamine will agree that a remedy so effective as that reported is indeed worthy of mention.

The composition of the preparation is as follows:—

Syntropan..	..	..	0.01 g.
Sedormid ..	..	..	0.1 g. per tablet.

syntropan being phosphate of the 3-diethylamino-2,2-dimethyl-propylester of tropic acid.

I am, Sir, yours faithfully,

C. STANTON HICKS,
Professor of Pharmacology and Human
Physiology, University of Adelaide.
Nov. 6th, 1935.

DR. ALBERT GRAY'S TECHNIQUE

To the Editor of THE LANCET

SIR,—May I in amplification of the account of Dr. Albert Gray's work contained in your obituary notice last week add something about the method of making transparencies of the membranous labyrinth which he devised and employed with such success in his work "The Labyrinth of Animals." This process yields at one stage perfect casts of the bony labyrinth, but the finished product is much more than a cast and contains all the structures of the membranous labyrinth, perfectly cleared and preserved. I am, Sir, yours faithfully,

C. S. HALLPIKE.

Ferens Institute of Otolaryngology, Middlesex
Hospital Annexe, Jan. 20th.

COLLAPSE THERAPY IN PLEURISY AND PNEUMONIA

To the Editor of THE LANCET

SIR,—I read with much interest the observations of Dr. C. Shaw in your issue of Dec. 7th, 1935 (p. 1280), on artificial pneumothorax for the relief of acute pleural pain. I made observations on 12 cases so treated (Calcutta Med. Jour., August, 1934) which did well and I remarked:

"It was quite reasonable to think that it should be so, because the partial collapse of the lung at once stopped friction between the two inflamed layers of the pleura, gave rest to the diseased area, relieved local congestion and pain and hastened repair and convalescence. Further, by maintaining this state of partial collapse by giving more fillings afterwards, healing was perfect, and the chance of relapse or formation of adhesion or effusion was very much minimised. The author is in touch with some of these cases for over two years and they are keeping perfectly fit."

I read with equal interest Dr. W. E. Robertson's paper in the same issue of THE LANCET (p. 1282), for I had treated similarly 20 cases of pneumonia with excellent results—only 3 deaths—my main difficulty being to find a sufficient number of suitable cases.

Since the influenza pandemic of 1918-19, the infective organisms of acute catarrh of the respiratory

¹ Jour. of Hyg., 1925, xxiv., 427; Proc. Roy. Soc. Med. (Sec. Epidem.), 1927, xx., 1609.

tract are usually of mixed character, true lobar pneumonia, in Calcutta at least, being comparatively rare. The usual picture is one of acute bronchial catarrh, in some cases with patches of consolidation forming from day to day, which by fusion give rise to pseudo-lobar consolidation. In these cases as well as in true lobar cases A.P. treatment often gave a very favourable result. With Dr. Robertson I have found that (1) A.P. does confer almost instant relief upon those suffering from coincident pleuritis; (2) it ameliorates cough and expectoration; (3) it frequently lowers the temperature, sometimes to a surprising extent. Dr. Robertson thinks that it does not cut short the attack of pneumonia, but in my cases I found that A.P. treatment nearly always brought down the pulse and the respiratory rate, lessened toxæmia, and caused considerable improvement in general condition, thus shortening the course of the disease and reducing its mortality.

Specific treatment with Felton's serum is very expensive; typing is difficult, and once consolidation has been established serum is not so effective. In all late cases A.P. treatment is more suitable. Dr. Robertson has pointed out that it is innocent of any collateral ill-effects, to which I fully agree. Since 1932 in my wards in the Campbell Medical School and Medical College Hospitals it has been routine treatment to perform partial collapse in all cases of uncomplicated acute primary pleurisy and circumscribed lobar-like consolidation. The quantity of air introduced varies from 100 to 400 c.cm., depending mainly on the amount of pleural space available. In some cases one operation was sufficient but in others it had to be repeated, and in bilateral cases partial collapse was maintained on both sides.

I am, Sir, yours faithfully,

Calcutta, Jan. 2nd.

A. R. MAJUMDER.

ABDOMINAL VARICOSITIES

To the Editor of THE LANCET

SIR,—In your issue of Jan. 11th Mr. A. L. d'Abreu describes two cases of varicose veins of the legs which showed by the presence of abdominal varicosities that some obstruction was present in the deep veins of the trunk, and states that he regards the existence of the latter as prohibiting the treatment of the leg veins. His view, however, is not securely founded either on theory or fact. If the saphenous veins show a positive Trendelenburg test they can be safely treated whether the patient has obstruction of the vena cava or not. Some years ago I obliterated the varicose veins in the legs of a similar case with satisfactory results and showed the man before a society, not because I regarded the treatment as unusual, but because the deep obstruction in the abdomen appeared to be congenital. Further, it is held by some, including Dickson Wright (Brit. Med. Jour., 1931, ii., 561), that even when the obstruction is in the deep veins of the leg itself the superficial varicosities are merely an added embarrassment to the circulation, and I have treated several such cases without regret. It would, of course, be generally regarded as bad treatment to deal with the abdominal veins, but V. Meisen (Varicose Veins and Hæmorrhoids, London, 1932, p. 50) has done so in a case with deep abdominal thrombosis, and apparently without ill-effect, and with cure of the coincident eczema. It is a curious fact that these abdominal varicosities sometimes appear without any apparent cause for obstruction of the inferior vena cava or the iliac veins.—I am, Sir, yours faithfully,

Birmingham, Jan. 16th.

J. W. RIDDOCH.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdrs. G. Kirker to *Drake* for R.M. Infirmary, Plymouth, and J. F. H. Gausson to *Lucia*
Surg. Lt.-Cmdr. W. A. Hopkins to be Surg. Cmdr.
Surg. Lt.-Cmdrs. J. C. Souter to *Drake* for R.N. Hospital, Plymouth, and A. M. Lawrence-Smith to *Victory* for R.N.B. and to *Dolphin*.
Surg. Lt.-Cmdr. (D.) L. M. Hughes to *Victory* for R.N.B.
Surg. Lts. H. G. Silvester to *Duncan*, A. E. Ginn to *Herald*, W. F. Viret to *Tern*, J. L. S. Steele-Perkins to *Sandwich*, and F. H. Lamb to *Folkestone*.

ROYAL ARMY MEDICAL CORPS

Short Service Commissions: Lts. J. G. M. A. Brunet and R. O. A. Leroux to be Cpts.

ROYAL AIR FORCE

Medical Branch.—Wing Comdrs. P. T. Rutherford, O.B.E., to Headquarters, Fighting Area, Uxbridge, for duty as Principal Medical Officer, vice Group Captain K. Biggs, M.C., and E. C. K. H. Foreman to No. 10 Flying Training School, Ternhill, for duty as Medical Officer.
Squadron Leader C. A. Lindup to No. 8 Flying Training School, Montrose, for duty as Medical Officer.

Dental Branch.—Flying Officer Alexander Maben, L.D.S., is promoted to the rank of Flight Lt.

Flight Lts. Hugh Bannerman, F. W. P. Dixon, and C. R. Palfreyman have been selected for permanent commissions in the medical branch, subject to physical fitness; they entered as flying officers in 1930–32.

INDIAN MEDICAL SERVICE

Lts. (on prob.) to be Cpts. (on prob.): I. J. Franklen-Evans, J. Duffy, and K. Cunningham.

Lt.-Col. B. Higham, C.I.E., retires.

Indian Medical Department.—Maj. (Sen. Asst. Surg.) T. J. Gibson retires.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED
JAN. 11TH, 1936

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2397; diphtheria, 1264; enteric fever, 21; acute pneumonia (primary or influenzal), 1571; puerperal fever, 58; puerperal pyrexia, 117; cerebro-spinal fever, 23; acute poliomyelitis, 7; acute poli-encephalitis, 1; encephalitis lethargica, 7; dysentery, 21; ophthalmia neonatorum, 91. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Jan. 17th was 3850, which included: Scarlet fever, 1098; diphtheria, 1150; measles, 433; whooping-cough, 599; puerperal fever, 17 mothers (plus 11 babies); encephalitis lethargica, 280; poliomyelitis, 4. At St. Margaret's Hospital there were 18 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 43 (4) from measles, 5 (0) from scarlet fever, 28 (5) from whooping-cough, 36 (7) from diphtheria, 44 (12) from diarrhoea and enteritis under two years, and 110 (18) from influenza. The figures in parentheses are those for London itself.

The mortality from influenza is the same as last week, the total deaths for the last six weeks (working backwards) being 110, 110, 80, 67, 62, 45. They are scattered over 56 great towns, Birmingham reporting 8, Oldham 5, Bradford and Newcastle-upon-Tyne each 4, Luton, Leeds, Sheffield, and Coventry each 3, no other great town more than 2. Liverpool and Manchester each had 9 deaths from measles, Bristol and Nottingham each 4. Liverpool also reported 8 deaths from whooping-cough. Deaths from diphtheria were reported from 18 great towns: Liverpool 4, Hull 3, Darlington, Sheffield, Warrington, and West Hartlepool each 2.

The number of stillbirths notified during the week was 246 (corresponding to a rate of 37 per 1000 total births), including 33 in London.

OBITUARY

ANDREW FRANCIS DIXON, M.B., B.Ch. Dub.

THE death occurred on Jan. 15th of Andrew Francis Dixon, professor of human anatomy and embryology in the University of Dublin. Born in 1868, he came of a well-known Dublin family. One of his brothers occupies the chair of botany in Dublin University and another until lately was professor of engineering in the City and Guilds College of Engineering, London, while his uncle, R. V. Dixon, was a fellow of Trinity College.

Francis Dixon entered Dublin University in 1885 and had a brilliant academical career, gaining a senior moderatorship and gold medal in natural science and securing many other distinctions, as well as obtaining in 1893 the medical degrees M.B., B.Ch., B.A.O. During the course of his medical studies he first came in contact with the late Prof. D. J. Cunningham who so greatly influenced his career. His early interests were in zoology and his first publications were concerned with the marine invertebrates, in which he was intensely interested all his life. But in 1893 his attention was turned more definitely towards human anatomy and he went to Leipzig to study under the late Prof. His. A year later he was appointed chief demonstrator in anatomy in Trinity College, Dublin, under Cunningham. In 1897 he was appointed professor of anatomy in University College, Cardiff, but in 1903 he returned to his old college to succeed Cunningham as professor of anatomy and chirurgery in the medical faculty, and from that date his whole-hearted service and loyalty were devoted to Trinity College. In 1916 he was appointed the representative of the college on the General Medical Council; in 1922 he was appointed to the newly founded chair of human anatomy and embryology, and in 1924 he became dean of the Faculty of Physic. And perhaps his greatest work was his devotion to the interests of the students and the ardour with which he worked for them, especially in their early post-graduate years. He was keenly interested in all their activities and took a very large part in organising the Trinity College Association with the object of keeping them in touch with each other and with their college. He was also actively interested in the old O.T.C. and in the Dublin University Biological Association, of which society he was president in 1904-05.

Outside the University Prof. Dixon had a very wide circle of friends and interests. He was a life-long member of the Anatomical Society of Great Britain and Ireland, and was elected president of that society in 1934. From 1917 to 1925 he was a member of the council of the Royal Dublin Society and in the latter year was appointed a governor of the society. On six separate occasions he was elected a member of the council of the Royal Irish

Academy, and in 1919 and again in 1926-27 he was a vice-president. For thirty years he was a member of the council of the Royal Zoological Society of Ireland, and from 1927 to 1931 was their president. He was a fellow of the Royal Academy of Medicine in Ireland and in 1906-08 was president of the section of anatomy and physiology. In 1934 he was appointed warden of Alexandra College. His many personal friendships and his wide sympathies made him a very valuable link between the university and outside bodies.

In his younger days Dixon published many interesting contributions to anatomical science. Our knowledge of the development of the fifth cranial nerve, of the course of the taste fibres, of the structures in the female pelvis, and of many interesting features in the skeleton has been considerably extended by his researches. But in later years pressure of administrative duties and heavy responsibilities in directing the medical school necessarily curtailed his time for such work. But those who knew him realised that he possessed an amazing fund of original observations and accurate knowledge on many interesting points, and regretted that lack of time and his own modesty prevented him from committing them to print.

He will be remembered always as a very loyal and warm-hearted friend. His memory for faces was extraordinary, and Trinity men revisiting the college after a lapse of many years were always sure of a warm personal welcome from the dean. For the college itself he entertained such a loyal devotion that no task was either too large or too menial for him to undertake if he felt that its interests were concerned.

We have received from our Dublin correspondent the following estimate of Dixon's great services, not only to his University but to the scientific world:—

"For nearly half his life—thirty-two years—Francis Dixon was head of the department of anatomy in the School of Physic; for nineteen years he represented the University of Dublin on the General Council of Medical Education and Registration, and for eight years on the Irish Medical Registration Council; he represented the professors of the university on the board—the governing body—of Trinity College; he was for many years past dean of the School of Physic. It is clear that the character of the school during the last thirty years must have been largely influenced by him. It is difficult for any but his colleagues to realise how sound and constructive was that influence, and how kindly, wisely, and unselfishly it was exercised. With an essentially conservative outlook and with a firm confidence in the mode of education which was traditional in Dublin, he never ceased his determination to keep that education in touch with modern requirements. He insisted on his students learning their anatomy



A. Francis Dixon

soundly, but he never forgot that his first duty was to fit them for medical practice. At the same time any senior student or young medical man who desired to study anatomy more deeply or to investigate any particular problem of anatomy with a clinical bearing received every encouragement and facility. When he was appointed in 1903 to the chair he succeeded two great anatomists—Alexander Macalister and Daniel John Cunningham; in his hands the reputation of the school of anatomy, both as a teaching institution and as a centre of research, was not only maintained but increased. He contributed frequently to the various scientific journals, and he always had something solid to contribute. His publications were marked by clarity, precision, and modesty. His teaching of his anatomy class had the same characters, and he held the attention and roused the interest of his students without apparent effort. He contributed the section on urogenital anatomy to Cunningham's 'Text-book of Anatomy,' and gave much assistance to the editor in the production of the first edition. He also wrote a 'Manual of Human Osteology' which has become a favourite text-book in many schools. His chief interests in original work lay in the fields of embryology and comparative anatomy.

"His responsibility as dean of the school kept him in touch with the work of all his colleagues. His influence on them and their work was more that of an elder brother than of an official of the university. He never intruded and never interfered, but his advice and help were at the disposal of all of them, and it is only since his retirement that they realise how much they had come to rely on him. They knew that his advice would be wise, and would be given without any slightest touch of self-interest or self-seeking. A shy man and a modest, he never liked pressing his opinions on others, but nevertheless he held strongly to his own convictions, and when a difference of opinion occurred he stated his views clearly and tersely, and then left it to others to make their decision according to their conscience as he had made his.

"His relations with his pupils were of the happiest. He did not tolerate slackness and he insisted on a high standard of work, but it was only in the rarest cases that he adopted disciplinary measures. Many a respected and respectable practitioner, inclined in his youth to idleness or folly, can look back to the help and guidance of Dixon as one of the important influences in his career.

"Dixon's friends will remember with pride his honourable career, his achievements, his services to his University, and to medical education. Their pride will, however, be lost in their affection for the man, the wise counsellor, the trusty friend whose friendship never stood out so strong as in time of trouble or anxiety."

JOHN BRIGHT BERRY, M.D. Edin.

Dr. John Berry, who died on Jan. 11th at the age of 79, was the doyen of the medical profession at Keighley. He graduated as M.B., C.M. Edin. in 1880, proceeding at a short interval to the M.D. degree. He practised for a time at Bradford, but some 40 years ago went to Keighley and pursued his vocation there until he retired in 1920. During a great part of his life in Keighley Dr. Berry held an honorary consulting position to the Victoria Hospital and he was closely connected with the Bradford Medico-Chirurgical Society of which he

was past-president. He always showed himself a skilful and progressive surgeon and was the first man to excise a diseased joint at the Keighley Hospital, while it is a matter of interest that he should have attended Lister's last course of lectures in Edinburgh. A correspondent writes: "Dr. Berry was the real doctor, available to anyone at any time, fee or no fee, and many of the older generation in Keighley will remember him with feelings of real affection."

STEWART RANKEN DOUGLAS, F.R.C.P. Lond., F.R.S.

DEPUTY DIRECTOR, NATIONAL INSTITUTE FOR MEDICAL
RESEARCH, HAMPSTEAD

WE regret to announce the death of Captain S. R. Douglas, deputy director of the National Institute for Medical Research, Hampstead, and director of the department of experimental pathology, who died at his residence in Buckingham-gate, London, on Monday, Jan. 20th, at the age of 64.

Stewart Douglas was born at Coulsdon Grange, Caterham, in 1871, the son of the late Mr. J. A. Douglas. He was educated at Haileybury, and proceeded for his medical training to St. Bartholomew's Hospital. He qualified with the English double diploma in 1896 and entered the Indian Medical Service as a surgeon-lieutenant. He did good work quite early in his career under the Plague Commission, and served with the China Expedition in 1900-01, being promoted captain and receiving a medal for his services. After the expedition he was invalided home much broken in health, but he determined to return to work and pursue a career of medical research that had already deeply attracted him. At this period he came into a close association with Sir Almroth Wright at



CAPT. S. R. DOUGLAS

[Photograph by Elliott & Fry]

St. Mary's Hospital, and from 1907 for seven years was assistant director of the inoculation department at this hospital and a member of the medical staff of the institution as lecturer on bacteriology in the medical school. His status as a teaching pathologist was thus established. In 1903 he communicated to the Proceedings of the Royal Society in collaboration with Sir Almroth a paper on the experimental investigation of the rôle of the blood fluids in connexion with phagocytosis. In the next year followed further observations on the rôle of the blood fluids and a communication on the protective substances elaborated in the blood in response to inoculation with a tubercle vaccine. These papers were also read before the Royal Society, while he published in THE LANCET (this in association with Major F. W. Hardy) some valuable pathological observations on bilharzia diseases, and in 1907, also in THE LANCET, a report on infective endocarditis

cured by the inoculation of a vaccine prepared from organisms found in the patient's blood.

Thus at the outbreak of war Captain Douglas's scientific reputation was well established. On August 1st, 1914, he had been appointed to the bacteriological staff of the Medical Research Council but instead of taking up this work he took a commission in the R.A.M.C. and was for a time engaged in research work in France. But here the duties proved beyond his physical strength and he was soon invalided home, but only to continue his work enthusiastically. He was engaged in the laboratories of St. Mary's Hospital in organising the production of vaccines for the use of the troops and in making special researches on, among other things, infection in wounds and dysentery; for these valuable labours he was decorated and appointed also Chevalier de l'Ordre Couronne, Belgium.

In 1922 Douglas was elected F.R.S. and appointed director of the pathological department at the National Institute for Medical Research, later becoming deputy director of the institute.

In 1920 he married Frances, née Dayrell, widow of Dr. J. B. Nias, but leaves no children.

To the many who came into personal contact with him, as to ourselves, Douglas's genial manner, unvarying kindness, and aptitude for friendship made an appeal that will not be forgotten. In the tributes which follow these characteristics of the man are displayed.

Sir Henry Dale, Sec. R.S., writes:—

"The sudden news of the death of my staunch friend and dearly loved colleague S. R. Douglas reached me by cable while I was in Holland at the week-end. I had known and liked him at casual meetings for some years, before we became in 1914, just before the war, fellow members of the then newly appointed nucleus staff of the future National Institute for Medical Research. War activities separated us, and it was not till the institute begun its work at Hampstead, in 1920, that our intimate association began. Douglas was then acting director of the institute's largest department, dealing with bacteriology and experimental pathology, and was made full director of it a year or two later; Leonard Hill, John Brownlee, and I directing the other three departments, as originally conceived. Brownlee's death, and Hill's retirement by seniority some years ago, had left Douglas and myself the only remaining members here of the original staff. The organisation of the institute and with it the official form of Douglas's relation to myself have undergone some changes in the years that intervened; but never has there been any hint of change in the confidence and loyal friendship, in the quiet and unselfish help and coöperation, which he has given to me, as to every member of our growing staff of colleagues, through the sixteen years of our close collaboration. We had all come to know even much more of Douglas's scientific worth than his modest self-effacement showed outside our circle, and we all know that we have lost a colleague whose genius for friendship and unselfish instinct for adjustment have been of priceless value to the happy coöperation of our community."

Sir Patrick Laidlaw, F.R.S., writes:—

"It has been my great privilege to know Captain Douglas for the last fifteen years. This may seem a fair period but I feel it was not nearly long enough. Throughout most of this time I worked under him or with him at the National Institute for Medical

Research, and to me, as to all other workers in the department of experimental pathology, which he largely helped to build, he was unfailingly kind in giving advice, encouragement, or criticism. For example, both Dunkin and I are greatly indebted to him for assistance in the distemper investigation. He was in close touch with all the virus studies under progress in his department, and indeed initiated some and frequently guided a whole research, though his name did not appear on the final publication. He brought to the study of virus problems a mind ripe with bacteriological knowledge and experience gained in India, China, and at St. Mary's Hospital with Sir Almroth Wright, to the great benefit of less mature research workers.

"Douglas was always keenly interested in 'acid-fast' bacilli and diseases produced by them. He developed special synthetic media for the cultivation of the tubercle bacillus and produced a stock of tuberculin prepared from such a medium for use in a projected international inquiry. He was greatly interested in biochemical studies in connexion with tubercle bacilli, and assisted the late G. A. C. Gough's chemical studies by growing the necessary bacilli in large quantities, suggesting and assisting in new lines of work. The work on John's disease of cattle carried out by Dunkin at the institute farm at Mill Hill was helped forward by Douglas in the early stages. The same story might be repeated; Douglas in the background initiating new studies, encouraging his juniors, allowing them full freedom to develop their own ideas, and kindly to a fault even when criticism was necessary. Apart from pathology, which was his life work, Douglas was a keen field naturalist particularly interested in bird life and migration—e.g., he published two papers on the migration of woodcock. He was an ardent fisherman and enjoyed a good day's shooting. At the institute there is a gap which will never be filled, and my colleagues and I feel we have lost a very good friend."

Dr. Leonard Colebrook writes:—

"My recollections of 'Dougie'—most lovable of men—range over the years 1906 to 1921. I see him in the early days of the 'opsonic' era at the midnight tea parties at St. Mary's along with 'The Old Man' as we always called Sir Almroth Wright (he was then only 45), delighting us all with good stories, and banter, and shrewd comment upon whatever the work of the day had thrown up. From the tea parties we went back to a further bout of counting of phagocytic films, and Douglas perhaps to wrestle with some problems of technique till 2 or 3 in the morning. In technical skill he was our recognised master, for, without any special training, he had acquired an uncanny sense of how a job should be done. Hence it was that he contributed not a little to the 'technique of the teat and the capillary glass tube,' although the fundamental ideas and the stimulus to work them out came nearly always from Sir Almroth.

"At the outbreak of the European war, Douglas was quick to see the urgent need for bacteriological media that would yield better crops than those in current use if we were to produce the huge quantities of typhoid vaccine which were required for the Allied armies. This matter had been simmering in his head for some time and in the early autumn of 1914 he was able to publish in THE LANCET a description of the tryptic digest medium which usually bears his name and has been so widely employed ever since. This must rank as one of his most useful achievements. It was something of a calamity

when he went to Boulogne with Wright a few months later and started to create a laboratory in a damp cellar for the study of wound infections. Very severe sciatica soon sent him home and crippled him for years, but in spite of constant pain and want of sleep he carried on all through the war with cheerful curses, but never a complaint, and did valuable work at St. Mary's directing researches on Gallipoli dysentery and on wound infections. In this work I think he was at his best—and very happy—for he had a real flair for clinical observation and wise treatment—seeing always the man as well as the disease.

"I count it great good fortune to have been so closely associated with one so disinterested and so essentially efficient in all he undertook. For the rest, it may be truly said of him that he 'warmed both hands before the fire of life.'"

JEFFREY ALEXANDER AMHERST ORLEBAR, M.B., B.Chir. Camb.

Dr. J. A. A. Orlebar, whose death occurred on Jan. 1st at Hove, was honorary physician in charge of out-patients at Brighton and Preston Dispensary. He was 56 at the time of his death. Dr. Orlebar was the son of the Rev. J. E. Orlebar, rector of Glencarse, and was educated at St. John's School, Leatherhead, and Magdalene College, Cambridge, whence he proceeded for his medical training to St. Thomas's Hospital. He obtained the double English diploma in 1905 and graduated as M.B., B.Chir. Camb. in the same year. After holding an appointment at the Tewkesbury Hospital and acting as medical officer of health to the Brixworth rural district council, he was appointed house physician at the Royal Sussex County Hospital, Brighton, filling also the posts of assistant pathologist and bacteriologist. During the war he held a commission as temporary captain, R.A.M.C., and served in Suvla Bay, when his experience in the treatment of malaria led to his appointment as medical officer in charge of a tropical diseases clinic in connexion with the Ministry of Pensions. Apart from his purely professional work he took a practical interest in the St. John Ambulance Brigade and in the local activities of the British Medical Association.

MURDO BUCHANAN, M.B., Ch.B. Glasg.

Dr. Murdo Buchanan, who died on Jan. 9th at Darlington, was born on the island of Lewis and was educated at the Nicolson Institute, Stornoway, and the University of Glasgow. At Glasgow he graduated as M.B., Ch.B. in 1907, and on qualification became for a time surgeon to the St. Helen's Collieries. Later he practised at Bishop Auckland, Durham, but since 1916 was a partner in a practice in Darlington. He enjoyed a high local reputation as physician and surgeon and was appointed deputy coroner some three years ago. He was also keenly interested in ambulance work. Although only 53 years of age his death was not unexpected, as he had been in failing health for some time.

EDWARD ARGENT SAUNDERS, M.R.C.S. Eng.

THE death is announced at the age of 50, after a short illness, of Dr. Edward Argent Saunders, medical officer of health for Pembroke. The son of a well-known Welsh physician, he was educated at Epsom College and entered the medical school of the Middlesex Hospital, where he held the Freer Lucas scholarship. He took the English double diploma in 1912 and served as house surgeon at the Middlesex

Hospital when he returned to practice in Pembroke where in the course of a busy and successful career he obtained a large number of public appointments, being at the time of his death medical officer of health and school medical officer for the borough of Pembroke, civil medical officer in charge of the R.A.F. station at Pembroke Dock, in charge of the county fever hospital, and medical officer of the Post Office. He was actively interested in the work of the St. John Ambulance Association and of the local infant welfare clinic. Dr. Saunders was a keen sportsman, good with gun and rod, and his unexpected death occurred on return from a shooting expedition.

FRANCIS EDWARD FERNIE, M.R.C.S. Eng.

Dr. Francis Fernie, who died on Jan. 9th at Stone, at the age of 68, was a well-known and respected figure in the Stafford district. He was the eldest son of the late Dr. Edward Fernie, of Stone, was educated at Wellingborough school, and received his medical training at St. Bartholomew's Hospital. On qualifying with the English double diploma in 1893 he was for a time house surgeon at the Stockport Infirmary, returning to go into partnership with his father. As a young man Dr. Fernie was a prominent footballer, while to the end of his life he was a remarkably fine horseman.

TREATMENT AND DISPOSAL OF LONDON SEWAGE

AT a sessional meeting of the Royal Sanitary Institute, held on Jan. 14th, Mr. J. H. Coste, chief chemist to the London County Council, described some improvements which had been made in treatment of the ever-increasing flow of sewage from the London main drainage system. The method of sedimentation, with or without the aid of chemical precipitants, which has been in use since the days of Sir Joseph Bazalgette and Mr. W. J. Dibdin, has been remarkably successful, but recently experience has shown that the calls which are being made upon the London main drainage system and on the capacity of the River Thames as the final place of disposal have reached a point when further steps should be taken. In his paper Mr. Coste described the large activated sludge plant designed on lines suggested by Lieut.-Colonel W. Butler and Mr. E. H. Tabor, M.I.C.E., as the result of long-continued research by the L.C.C.'s officers. This plant, in which aeration for treatment is almost entirely effected at the interface between the mixture of activated sludge and the sedimented effluent which is to undergo further purification, is so arranged that the liquid flows through a two-tiered long channel, divided into 66 compartments, alternately being exposed to air and plunging into the lower compartment. By details of construction there is imparted to it a swirling motion, so that the air-liquid interface is continually renewed and absorption of oxygen from the air goes on rapidly. After travelling 6400 feet (over a mile) the issuing liquid goes to sedimenting tanks of two types: pyramidal, which yield better separation of solid from liquid and shallow Dorr tanks with scrapers which yield a denser sludge; thence the liquid part flows into the common effluent channel and the sludge to re-aeration tanks. These are fitted with diffuser tiles which have been found better adapted for aeration of sludge than the surface absorption used for the treatment itself. The plant

was constructed in the hope that it would suffice for treatment of from 5 to 10 million gallons a day. Since July, 1932, with very little intermission, 10 million gallons a day have been treated. At first it was sought to obtain a stable effluent; experiment has shown that the greatest effect of purification is obtained by producing a less purified effluent in greater amount.

A second direction of improvement has been explored in the form of sludge digestion, by means of which a large volume of gas of high calorific power is obtained, available for the production of heat and power, and a sludge of reduced organic content. The principal source of gas seems to be the mixture of fatty acids, present in part as soap in the sludge, and Mr. Coste and his colleagues have shown by micro-combustion and the difficulty in liquefying the gas that methane is the only hydrocarbon present in appreciable amount—a fact which has hitherto been assumed but not demonstrated. A large sludge digestion plant is to be constructed at the northern outfall, but this will supplement and not supplant disposal at sea; also five more units of activated sludge plant of the same capacity and on similar lines to that now in use are being constructed.

During the recent dry summers it has been found that some more thorough process than sedimentation,

supplemented by the use of ferrous sulphate as a fixative for sulphuretted hydrogen, was needed for the hot dry months of the year. Experiments made in the winter of 1934 with a variety of oxidising agents showed that ferric salts were the most suitable for such emergency treatment. It was found, however, that the quantities required—hundreds of tons a week—could not be obtained commercially. Experiments were, therefore, initiated on the chlorination of ferrous sulphate, which was obtainable. These were successful on the laboratory scale and at once plant of sufficient size was constructed at the southern outfall, followed by an improved plant at the northern. The work was not completed sufficiently early in the year 1935 for an unsatisfactory condition of the river to be avoided entirely, but the character of the effluent was undoubtedly improved and it is hoped that with the ability to start treatment at any moment, the condition of the Thames may remain satisfactory during the summer months. When the five activated sludge units under construction are completed still better conditions should be secured. Mr. Coste expressed his personal opinion that further improvements should be in the direction of better sedimentation and coagulation of sewage which had been brought to the outfalls in a non-septic condition.

MEDICAL NEWS

University of Cambridge

A course of lectures on human genetics will be delivered during the Lent term by Dr. L. S. Penrose, research medical officer of the Royal Eastern Counties Institution, Colchester. The lectures will be given on Fridays, at 5 P.M., and the first will be on Friday, Jan. 24th.

University of London

Prof. B. A. McSwiney has been appointed to the university chair of physiology at St. Thomas's Hospital medical school.

Dr. McSwiney, who was born in Chicago in 1894, received his medical education in Dublin. In 1915 he was awarded the Reuben Harvey scholarship by the Royal College of Physicians of Ireland for his work as student demonstrator in the school of physiology, but his work was interrupted by service as a naval surgeon-probationer. Returning to complete his medical course, he graduated as M.B. in 1917, worked for a time as assistant scientific adviser to the Ministry of Food, and in 1918 saw further war service with the R.A.M.C. After a brief period as assistant professor of physiology at Trinity College, Dublin, he went to Leeds in 1919 as university lecturer in experimental physiology, being appointed to the same post at Manchester a year later. He returned to Leeds in 1926 to fill the chair of physiology, and during his tenure of it has acted as examiner for the universities of Oxford, Cambridge, and Manchester, and for the National University of Ireland. His work has been largely concerned with pulse-wave velocity and the physiology of plain muscle, and he became a D.Sc. of Dublin in 1928.

Two lectures on perimetry will be given by Dr. H. M. Traquair, lecturer on diseases of the eye in the University of Edinburgh, at 5.30 P.M. on Feb. 10th and 11th, at University College Hospital medical school. On March 3rd, 6th, and 10th, at the same hour, Dr. Kuczynski, formerly director of the statistical office, Berlin-Schönberg, will lecture at University College on recent population trends. Lord Dawson will take the chair at his first lecture.

Society of Apothecaries

A livery dinner of this society will be held at Apothecaries' Hall, Water-lane, London, E.C., on Tuesday, Feb. 25th, at 7.30 P.M., when the Lord Mayor and sheriffs intend to be present.

Papworth Village Settlement

Dr. Walter Pagel will give a demonstration on the experimental production of early pulmonary tuberculosis in the Sims Woodhead memorial laboratory at Papworth Village Settlement on Saturday, Feb. 15th, at 3 P.M. All who are interested and wish to attend should communicate with Dr. Pagel at Papworth Hall, Cambridge.

Society of Public Analysts

A joint meeting of this society with the food group of the Society of Chemical Industry will be held on Wednesday, Feb. 5th, at the Chemical Society's rooms, Burlington House, Piccadilly, London, W. The afternoon session begins at 5 P.M. and the evening session at 8.15 P.M., and both will be devoted to a discussion on tea and coffee, with special reference to their tannins and alkaloid. The first paper of the evening session will be read by Dr. G. Roche Lynch, who will speak on the pharmacology of caffeine and of tea and coffee.

Dr. Barnardo's Homes

Last year 1396 children were admitted to Dr. Barnardo's Homes, among whom was the 118,000th child to be welcomed under the charter "no destitute child ever refused admission." The number at present in the Homes is about 8300, of whom 1455 are under 5 years of age.

Prince of Wales's Hospital, Plymouth

Lord Onslow recently opened at this hospital a new administrative and paying patients' block which has cost £40,000. Twenty-six paying patients can be accommodated and there are now enough rooms to enable all the nurses to sleep in hospital.

Ella Sachs Plotz Foundation

The trustees of this foundation are anxious to make known the resources of their fund for the advancement of scientific investigation. The foundation seldom or never offers stipends to investigators; nor does it provide apparatus and materials which are ordinarily part of laboratory equipment. Its special purpose is to give grants for the purchase of apparatus and supplies required for special investigations and for the payment of unusual expenses, including technical assistance. The research should bear closely on medicine or surgery, and the maximum size of grants will usually be less than \$500. In the twelve years of its existence the foundation has made 252 grants and investigators have been aided in 26 countries. Applications for assistance should arrive before May 1st, including statements about the nature of the investigation, the amount of money wanted, and the way in which it will be spent. The secretary of the executive is Dr. Joseph C. Aub, Collis P. Huntington Memorial Hospital, 695, Huntington Avenue, Boston, Massachusetts, U.S.A.

King Edward's Hospital Fund for London

In aid of this Fund five special tours have been arranged, beginning with a visit to the Board of Admiralty and the Foreign Office, conducted by Mr. D. B. Smith and Mr. C. Howard Smith, on Feb. 8th. The other places to be visited will be the Houses of Parliament (Feb. 19th), the India Office (March 7th), Westminster Abbey (April 22nd), and the Zoological Gardens (May 8th). Tickets may be had from the secretary of the Fund, 10, Old Jewry, London, E.C.2.

German Congress for Actinotherapy

The third International Congress for Actinotherapy will be held in Wiesbaden from Sept. 1st to 7th under the presidency of Prof. W. Friedrich, director of the Institut für Strahlenforschung of the University of Berlin. Problems relating to the biology of light, to biophysics, and to the therapy of light will be discussed. Further information may be had from the secretary-general of the Congress, Dr. H. Schreiber, Robert Koch-Platz 1, Berlin, N.W.7.

Fifty Years of Public Service

On Jan. 17th Dr. Henry Lloyd received a presentation to commemorate his 50 years as poor-law medical officer for St. Asaph and district, an appointment he has held since the age of 25. Dr. Lloyd's brother, the late Dr. David Lloyd, was for many years medical officer for Denbigh, and he has two daughters in the medical profession, Dr. Muriel Radford and Dr. Katherine Quinby. The presentation was made by the Lord-Lieutenant of Flintshire.

Hospital Extensions at Southend

Southend borough council have decided to spend £304,000 on improving and extending the municipal hospital. There has been much opposition to the scheme on the ground of expense and the measure was passed only by a majority of 2.

Boscombe Hospital

The enlargement of the nurses' hostel of this hospital will probably be finished in April and two new operating theatres, a new ward with 24 beds, and three observation wards are also in course of construction. It is hoped to build a new maternity block later in order to free medical and surgical wards.

Paying Patients at Swindon

A scheme known as the Swindon and North Wilts Hospital Private Ward League is being inaugurated this month. An annual subscription of £1 ls. entitles a single man and £2 2s. a married man with a family to assistance in the cost of maintenance in the private wards of Swindon Victoria Hospital or in nursing-homes. X ray examinations and other expenses are included in the scheme. Full scale benefits are only payable after a year's membership.

Society for Relief of Widows and Orphans of Medical Men

At a meeting of the court of directors held on Jan. 1st the president, Mr. V. Warren Low, being in the chair, the deaths of five members were reported and five new members were elected. Four widows of deceased members applied for relief; a grant of £60 a year was voted to each, one widow over 65 receiving an additional £15 a year; two orphans had grants of £50 a year each. A sum of £2082 10s. was voted to cover the half-yearly grants to the 55 widows and 10 orphans in receipt of relief. The distribution was reported of £625 as a Christmas gift to the widows and orphans, each widow over 75 receiving £15, under 75 £10, and each orphan £10. A legacy of £45 had been received from the executors of the late Dr. W. Culver James, a vice-president of the society. Particulars of membership, which is open to any registered medical man who at the time of his election is residing within a 20-mile radius of Charing Cross, may be obtained from the secretary at 11, Chandos-street, London, W.1.

Scottish Board of Control

Dr. Laura Margaret Dorothea Mill has been appointed a deputy commissioner of the General Board of Control for Scotland.

Fellowship of Medicine and Post-Graduate Medical Association

Advanced courses will be held in proctology at St. Mark's Hospital (Feb. 3rd to 8th); in chest diseases at the Brompton Hospital (Feb. 10th to 15th); in gynaecology at the Chelsea Hospital (Feb. 10th to 22nd); and in anatomy and physiology for the F.R.C.S. (primary) in the Infants Hospital (Mondays, Wednesdays, and Fridays at 8 p.m., Feb. 24th to April 24th); and a M.R.C.P. clinical class will meet at the National Temperance Hospital, Hampstead-road, on Tuesdays and Thursdays from Feb. 25th to March 12th at 8 p.m. An all-day course in neurology will be given at the West End Hospital for Nervous Diseases (Feb. 3rd to 8th), and week-end courses include one in physical medicine at the St. John Clinic and Institute of Physical Medicine (Feb. 8th and 9th), one in children's diseases at the Princess Elizabeth of York Hospital (Feb. 22nd and 23rd), and one in chest diseases at the Brompton Hospital (March 7th and 8th). Courses are open only to members and associates. Full particulars and detailed syllabuses can be obtained from the secretary of the fellowship, 1, Wimpole-street, London, W.1.

British Red Cross Society and Order of St. John Hospital Library

The organising secretary of this movement (48, Queen's-gardens, Lancaster Gate, London, W.2) announces the delivery on four Wednesday evenings at 5.30 p.m. of the following addresses at the Foyle Art Gallery, Charing Cross-road, London, W.C.2. On Jan. 29th Miss Ann Bridge will speak on the novel and the conventions; on Feb. 12th Miss Dorothy Sayers will speak on the importance of being vulgar; on Feb. 26th Mr. Humbert Wolfe will give readings from his own works; and on March 11th Mr. Maxwell Fry, A.R.I.B.A., and Mr. A. R. Duncan, A.R.I.B.A., will start a debate, the former instructing the audience how to live and the latter taking up the attitude that we should live as we like. Tickets for the course are 2s. 6d. for a single lecture and 8s. 6d. for four lectures. The hospital library run under the aegis of Red Cross and the Order of St. John merits all the support that medical men can either personally give it or direct towards it. The organisation already sends gifts of books to over 2000 hospitals, and the amount of pleasure and profit which patients derive therefrom must be extremely large.

INDEX TO "THE LANCET," VOL. II., 1935

THE Index and Title-page to Vol. II., 1935, which was completed with the issue of Dec. 28th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

Appointments

GOODWIN, AUBREY, M.D. Lond., F.R.C.S. Eng., has been appointed Obstetric Surgeon to the Westminster Hospital.
HEWLETT, R. F. L., M.B., Pathologist at the Group Laboratory, Lambeth Hospital, L.C.C.
MACKAY, J. S. B., M.B. Aberd., D.P.H., Assistant Tuberculosis Officer for Manchester.
MCNAB, G. H., M.B. Edin., F.R.C.S. Eng., Surgical Registrar at the Hospital for Epilepsy and Paralysis, Maida Vale.
MILLER, ARTHUR, F.R.C.S. Edin., Consulting Oto-laryngologist to the Wimbledon Fever Hospital.
MILNER, J. G., M.B. Camb., F.R.C.S. Eng., Assistant Surgeon to the Royal Westminster Ophthalmic Hospital.
RUNDLE, FRANCIS, M.B. Sydney, F.R.C.S. Eng., Surgical Registrar at the Westminster Hospital.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, Jan. 27th.

Odontology. 8 P.M. Mr. Cyril Howkins: The Blood-supply of the Lower Jaw. Mr. R. Bradlaw: Innervation of the Teeth.

TUESDAY.

Medicine. 5 P.M. Dr. Otto Leyton: The Morbid Conditions which Cause Progressive Hyperglycemic Glycosuria and the Circumstances which Modify its Course. Dr. J. Graham Willmore, Dr. H. P. Hims-worth, and Dr. T. C. Hunt will also speak.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.
MONDAY, Jan. 27th.—8.30 P.M., Mr. V. Zachary Cope: The Treatment of Acute Appendicitis.

SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Thorn-haugh-street, W.C.

FRIDAY, Jan. 31st.—Mr. A. Felix, D.Sc., and Dr. C. J. McSweeney: The Serum Treatment of Typhoid Fever. (Fever group.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.

MONDAY, Jan. 27th.—5 P.M., Mr. E. P. Stibbe: The Anatomy and Surgery of the Subtentorial Angle.

WEDNESDAY.—5 P.M., Mr. R. T. Payne: Pyogenic Infections of the Parotid.

FRIDAY.—5 P.M., Mr. George A. Mason: Extirpation of the Lung. (Hunterian lectures.)

UNIVERSITY OF LONDON.

FRIDAY, Jan. 31st.—11 A.M. (London School of Hygiene, Keppel-street, W.C.), Mr. H. E. Magee, D.Sc.: Nutrition.

ROYAL INSTITUTION, 21, Albemarle-street, W.

FRIDAY, Jan. 31st.—9 P.M., Prof. E. Mellanby, F.R.S.: Advances in the Treatment of Disease.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL, N.W.

WEDNESDAY, Jan. 29th.—4 P.M., Dr. A. J. Scott Pinchin: Points in the Diagnosis and Treatment of Pulmonary Tuberculosis.

LONDON SCHOOL OF DERMATOLOGY, 5, Lisle-street, W.C.

TUESDAY, Jan. 28th.—5 P.M., Dr. J. L. Franklin: Bullous Eruptions.

WEDNESDAY.—5 P.M., Dr. I. Muende: Histopathology.

THURSDAY.—5 P.M., Dr. W. K. Sibley: Electrotherapeutics.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

WEDNESDAY, Jan. 29th.—2 P.M., Dr. Wilfrid Sheldon: Medical Aspects of Empyema, Pulmonary Abscess, and Pyopneumothorax. 3 P.M., Dr. W. W. Payne: Blood Chemistry in Normal Respiration.

Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, Jan. 27th.—3.30 P.M., Dr. Hinds Howell: Neuro-syphilis (I).

TUESDAY.—3.30 P.M., Dr. Critchley: Cerebral Vascular Disease (I).

WEDNESDAY.—3.30 P.M., Dr. Kinnier Wilson: Clinical Demonstration.

THURSDAY.—3.30 P.M., Dr. Carmichael: Subacute Combined Degeneration.

FRIDAY.—3.30 P.M., Mr. Elmquist: Demonstration of Re-educational Methods.

Out-patient clinic daily at 2 P.M.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Jan. 27th, to SATURDAY, Feb. 1st.—ST. JOHN'S HOSPITAL, 5, Lisle-street, W.C. Afternoon course in dermatology. (Open to non-members.)—ST. PETER'S HOSPITAL, Henrietta-street, W.C. All-day course in urology.—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W. Tues., 8.30 P.M., Mr. Hamilton Bailey: Neck. Thurs., 8.30 P.M., Mr. A. Dickson Wright: Skull and Brain.—Courses are open only to members of the fellowship.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.

WEDNESDAY, Jan. 29th.—4 P.M. (St. James's Hospital, Ouseley-road, S.W.), Mr. George Perkins: Fractures in General Practice.

LEEDS GENERAL INFIRMARY.

TUESDAY, Jan. 28th.—3.30 P.M., Mr. Jeaftresson: Ante-partum Hemorrhage.

LEEDS PUBLIC DISPENSARY AND HOSPITAL.

WEDNESDAY, Jan. 29th.—4 P.M., Mr. A. D. Sharp: Ear, Nose, and Throat—Selected Cases.

UNIVERSITY OF DURHAM.

SUNDAY, Feb. 2nd.—10.30 A.M. (Newcastle General Hospital), Mr. J. Collingwood Stewart: Selected Cases.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.

WEDNESDAY, Jan. 29th.—4.15 P.M. (Eye Infirmary), Dr. J. Barbour Stewart: Squint and its Treatment.

Vacancies

For further information refer to the advertisement columns

Abyssinia (Gondar).—Two M.O.'s. Each £600.

Ayr Royal Burgh.—M.O.H. £800.

Barry Surgical Hospital.—Res. Surg. O. £350.

Bath, Royal United Hospital.—H.S. At rate of £150.

Beckenham, Bethlem Royal Hospital, Monks Orchard.—Jun. Asst. Phys. £350.

Birmingham City Maternity and Child Welfare Dept.—Temp. M.O. £10 per week.

Birmingham, Romsley Hill Sanatorium.—Res. Asst. M.O. £240.

Blackburn, Brockhall Institution for Mental Defectives, Langho.—Jun. Asst. M.O. £500.

Blackburn and East Lancashire Royal Infirmary.—Res. Surg. O. £250.

Bradford Royal Infirmary.—H.S. At rate of £135.

Bridport and Lyme Regis Boroughs, &c.—M.O.H. £800.

Buxton Clinic for Rheumatism and Allied Diseases.—H.P. At rate of £200.

Canterbury, Kent and Canterbury Hospital.—H.P. At rate of £125.

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Third Res. H.S. At rate of £75.

Chester Royal Infirmary.—H.P. and H.S. Each £150.

Colchester, Royal Eastern Counties' Institution for the Mentally Defective.—Asst. M.O. £350.

Doncaster Royal Infirmary.—H.S. to Eye and Ear, Nose, and Throat Depts. £175.

Downpatrick, Down Mental Hospital.—Jun. Asst. M.O. £300.

Dulwich Hospital, S.E.—H.P. At rate of £120.

East Ham Memorial Hospital, Shrewsbury-road, E.—H.P. At rate of £150.

Edmonton, North Middlesex County Hospital.—Jun. Res. Asst. M.O. At rate of £250.

General Lying-in Hospital, York-road, Lambeth, S.E.—Jun. Res. M.O. and Anesthetist. At rate of £100.

Gloucestershire Royal Infirmary, &c.—H.S. At rate of £150.

Hertford, Ware Park Sanatorium.—Asst. M.O. £300.

Hove General Hospital.—Hon. Phys. to Brighton Branch.

Ipswich Sanatorium, Foxhall-road.—Asst. M.O. £350.

Lambeth Hospital, Brook-street, S.E.—Asst. M.O. £350.

Leeds General Infirmary.—Hon. Asst. Phys.

Leicester City General Hospital.—Two Res. M.O.'s. Each £300.

Liverpool, Mill-road Infirmary.—Res. Asst. M.O. £200.

Liverpool, Sanatorium, Dclamere Forest, Frodsham.—Second Asst. Med. Supt. £200.

Liverpool, Smithdown-road Hospital.—Res. Asst. M.O. £200.

Liverpool, Walton Hospital.—Res. Asst. M.O. £200.

London County Council.—M.O. for Henniker House, Parsons Green. £100.

Maidstone, Kent County Ophthalmic and Aural Hospital.—H.S. to Ear, Nose, and Throat Dept. At rate of £200.

Manchester Ear Hospital, Grosvenor-square, All Saints'.—H.S. At rate of £150.

Middlesex County Council.—Asst. M.O. £600.

Mile End Hospital, Bank-road, E.—Asst. M.O. £350.

Newcastle-upon-Tyne, Hospital for Sick Children.—Res. Surg. O. £250.

Northampton County Mental Hospital, Berrywood.—Second Asst. M.O. £450.

Paddington Hospital, Harrow-road, W.—Asst. M.O. £350.

Plymouth City.—Deputy M.O.H. £750.

Preston, W'rightington Hospital, Appley Bridge.—Jun. Asst. M.O. £200.

Princess Louise Kensington Hospital for Children, St. Quintin-avenue, W.—H.P. At rate of £100.

Queen's Hospital for Children, Hackney-road, E.—Res. M.O. At rate of £200. Also H.S. and Cas. O. Each at rate of £100.

Romford, Oldchurch Hospital.—Asst. Res. Radiologist and Jun. Res. M.O. Each £250. Also General Consulting Phys. £300.

Royal National Orthopaedic Hospital, 234, Great Portland-street, W.—Asst. Res. Surg. for Country Branch. £250.

Royal Naval Medical Service.—Eight vacancies.

St. Allege's Hospital, Vandrugh Hill, S.E.—Asst. M.O. £350.

St. Andrew's, Devon-road, E.—H.P. At rate of £120.

St. George-in-the-East Hospital, Raine-street.—Asst. M.O. £350.

St. John's Hospital, Lewisham, S.E.—Res. H.P. At rate of £100.

St. Peter's Hospital, Vallance-road, E.—Asst. M.O. £350.

St. Thomas's Hospital, S.E.—Reg. and Tutor to Obstet. Dept. £250. Also Reg. to Ophth. Dept. £150.

Salisbury General Infirmary.—H.S. At rate of £125.

Shrewsbury, Royal Salop Infirmary.—Res. H.S. At rate of £160.

Shrewsbury, Salop Mental Hospital.—Asst. M.O. £350.

Southend-on-Sea General Hospital.—Cas. O. At rate of £100.

Stirling District Mental Hospital, Larbert.—Jun. Asst. M.O. £300.

Stockport Infirmary.—H.S. £150.

Stoke-on-Trent, Stanfield Sanatorium.—Res. M.O. £250.

West London Hospital, Hammersmith-road, W.—Half-time Pathologist. At rate of £300.

West Riding of Yorkshire County Council.—School Medical Inspector. £500.

Western Ophthalmic Hospital, Marylebone-road, N.W.—Hon. Surg. to Inoculation Dept.

Woolwich and District War Memorial Hospital, Shooters Hill, S.E.—H.P. At rate of £100.

Worcestershire County Council.—County Analyst and Bacteriologist. £800.

The Chief Inspector of Factories announces vacancies for

Certifying Factory Surgeons at Coggeshall, Essex;

Frodingham, Lincs; and Auchtermuchty, Fife.

NOTES, COMMENTS, AND ABSTRACTS

A STUDY OF
MILK CONSUMPTION IN AN OUTER
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THE district council of Southall-Norwood has for many years supplied wet (as well as dried) milk, free or at half cost according to an economic circumstances scale, to expectant and nursing mothers and to children under three years of age attending the infant welfare centres. Children over three and under five years of age are also granted milk if there are definite medical reasons for its use. The procedure has been to write an order on a milkman chosen by the family, and as free choice has always been allowed, this has meant that the usual family milkman has supplied the milk and has been paid by the council.

The health department has been increasingly careful about the maintenance of cleanliness in the dairies of all retailers and there is no doubt that a great improvement has been made in the cleanliness of the milk retailed. From time to time, however, consistently unsatisfactory bacteriological results have been obtained from the milk of certain dairymen, and so it was decided to institute an investigation into the safety or otherwise of all the milk consumed in the district. The primary object of this investigation was in order to see if sufficient of the milk consumed was "safe" to warrant confining the council's payments to retailers who sold safe milk; the results may be of more general interest in showing the amount of milk consumed in an average London suburb.

Southall is a district, on the fringe of greater London, which has grown rapidly in recent years. There are about 100 factories of varying size in the area, but a proportion of the working population appears to be to an increasing extent of the dormitory type. The population, as calculated to the middle of 1934 by the Registrar-General, was nearly 47,000. It is almost certain that it is now (at the time of the investigation) just about 50,000. Of this figure, 3000 are resident in a mental hospital in the district, and this hospital, which has its own milk-supply, has been excluded from the figures given below, thus leaving a net population for the purpose of this investigation of 47,000. The area forms a convenient unit of its own with natural boundaries except in two small districts, and the figures given for the total consumption of milk may be taken as reliable.

The figures of milk consumed have been obtained from the retailers, in confidence as far as their names are concerned, and where the retailers have served both this and a neighbouring district an assessment has been made of the amount consumed in this district. I have no reason to doubt the reasonable accuracy of the totals submitted.

GRADING

Table I. gives the grouped results of the investigation. Two columns have been included which show the difference between the largest and the smallest amounts of classified milks sold by individual retailers.

Of the pasteurised milk, excluding that done by

the flash method, only 18 per cent. is pasteurised in the district, the rest being imported from firms outside. The milk so imported comes from eight different firms. Dalrymple-Champneys¹ has given

TABLE I

Milk retailed during first week in October, 1935. Number of retailers, 21; total number of retail shops, 41

Description.	Number of retailers.	Amount sold in pints by retailers.		Total sold—Pints and percentage.
		Larg-est.	Small-est.	
1. Legally pasteurised (including Grade A Past.)	9	28,555	780	100,936 (62·15)
2. Otherwise pasteurised—				
(a) Ordinary	9	7,680	1,200	34,244 (21·08)
(b) Flash ..	1	—	—	13,500 (8·31)
3. Certified ..	2	124	3	127 (0·08)
4. Grade A (T.T.)	6	237	12	553 (0·34)
5. Grade A ..	8	200	16	772 (0·48)
6. Sterilised ..	10	2,912	12	4,506 (2·78)
7. Homogenised ..	7	1,254	8	2,946 (1·81)
8. Sun ray ..	1	—	—	8
9. Raw	3	2,800	10	4,810 (2·99)
		Total	..	162,402

in detail the requirements for the proper supervision of milk pasteurising plants, but it has been felt for some time that a check on the end-result, more simple and reliable than bacteriological counts, which may be completely unreliable (Howell²) or which may appear satisfactory even when the milk is not properly pasteurised, is required. Kay and Graham,³ of the National Institute of Research in Dairying at the University of Reading, have recently evolved a simple test which they claim will show—

(a) whether milk has been heated to 1½° F. below the minimum temperature for pasteurisation, or

(b) whether it has been heated (at 145° F.) for twenty minutes or less, instead of the required thirty minutes, or

(c) whether raw milk (down to 0·25 per cent.) has been mixed with properly pasteurised milk.

The principle is the hydrolysis of a phosphoric ester when incubated with milk containing phosphatase, and the colorimetric determination of the end-products. The enzyme phosphatase is a constant constituent of raw milk but is destroyed on heating to a certain temperature. This test, the phosphatase test, should prove very useful in checking the minimum requirements of a pasteurising plant. It does not however apparently indicate whether the maximum temperature (of 150° F.) has been exceeded, or by how much, or for how long, but this is immaterial when the only question is that of the safety of the milk examined.

Most of the pasteurised milk (legally, flash and otherwise) sold in this district was examined in this way by the National Institute of Research in Dairying, and of the sixteen samples submitted three failed to pass the test. Two of these were samples of flash pasteurised milk; the other was a sample of milk stated to be pasteurised but not sold as such. This related to a dairy selling 1600 pints of the above

total, and further inquiry revealed a reasonable certainty that raw milk had been added to it.

Excluding the milk to which these unsatisfactory results relate and also Nos. 7, 8, and 9 in Table I., a total of 139,738 pints is left (86 per cent. of the whole) which can be regarded as safe milk.

BACTERIOLOGICAL RESULTS

A check was also made at the time, and has been repeated subsequently, by obtaining bacterial counts. These are well known to be frequently inconsistent, but in this district, using the same outside laboratory, quite consistent results are usually obtained. In the period under review the results appeared particularly consistent and they are shown in Table II.

TABLE II.—*Bacterial Counts*

Description.	Number of samples.	Bacterial count.		Samples in which <i>B. coli</i> found in	
		Highest.	Lowest.	0·1 c.cm.	0·01 c.cm.
1. Legally pasteurised	4	85,000	8,300	1	0
2. Otherwise pasteurised—					
(a) Ordinary ..	5	800,000*	51,000	4	0
(b) Flash ..	4	31,200	9,000	2	1
3. Certified ..	1	3,400		0	0
4. Grade A (T.T.) ..	4	91,600	10,000	1	0
5. Grade A ..	4	4,000	100	0	0
6. Sterilised ..	2	200	100	0	0
7. Homogenised ..	1	6,000		0	0
8. Sun-ray ..	1	1,000		0	0
9. Raw	5	Millions (3)	92,000	5	4

*All the other samples were under 100,000.

These results are rather striking in that the only samples containing *B. coli* in 0·01 c.cm. are of raw milk (all except one of the samples submitted) and of flash pasteurised milk. The samples, too, in which *B. coli* were found in 0·1 c.cm. were mostly from dairies where the conditions generally obtaining were not such as to make these results unexpected. On the other hand, the sample of Grade A (T.T.) containing 91,000 organisms and *B. coli* in 0·1 c.cm. was a little surprising, and there must have been a slip up in the technique (although the result is well within legal standards). Some doubt, too, may be cast on a sample of Grade A milk containing only 100 organisms, but although it is not suggested that these analyses are of sufficient number to do more than indicate the gross differences between different milks, they are carried out at the same laboratory, and, as stated above, with similar conditions very consistent results are obtained.

AMOUNT OF MILK CONSUMED

The Astor Committee⁴ found that in January, 1918, the average consumption per head per day in London was just under a third of a pint. In August, 1925, the then Minister of Agriculture stated that the milk consumption per head of the population was 20 gallons a year. This is equivalent to about 0·44 pint per day, but probably did not take into account the amount used in manufacture of other articles for home consumption and for export. Variable figures for different towns and areas in Scotland

are quoted by Paton and Findlay.⁵ These ranged from 0·27 pint per man-value per day in a part of Glasgow in 1921, to 1·31 pints per man-value per day in an agricultural population in Ayrshire in 1924. These figures are roughly equivalent to 0·2 and 1·0 pints per head of population per day. Other investigations have been made from time to time into the amount of milk consumed per head of the population. In 1932 the Ministry of Health Advisory Committee on Nutrition⁶ reported that the consumption per head was still less than half a pint a day. More recently Leighton and McKinlay⁷ find that in large Scottish burghs the consumption was 0·417 pint, and in Scotland as a whole it was 0·479 pint. The Milk Marketing Board⁸ this autumn (1935) state that the consumption is 0·38 pint per head per day, but that this is only approximate.

The figures in this present communication show that in Southall, taken as a whole, the average consumption per head per day is just under half a pint. There are, however, three modifying factors which should be considered:

1. The amount of milk used in food factories (artificial cream, bakeries, margarine works, &c.) and likely to be consumed in the district. Inquiry shows that approximately 200 pints should be deducted from the total on this account.

2. The amount of milk consumed by persons while working outside the district. This will cover lunch and possibly tea, and to a large extent it will be offset by the fact that another large number of people (in the factories, &c.) have lunch and tea in the district although living outside.

3. The amount of dried milk used. During the week in question 107 lb. of dried milk (equivalent to 616 pints) were sold from the infant welfare centres. I have also ascertained that almost exactly the same amount of dried milk (109 lb., equivalent to 627 pints) was sold at shops (chemists, &c.) in the district during the week in question.

These extras make practically no difference to the daily consumption, which is 0·497 or just under half a pint per head. It will be seen, therefore, that the consumption per head per day appears a little larger than in the Scottish burghs and definitely larger than for the country as a whole.

COMMENT

Much opposition has been experienced from time to time by local authorities in obtaining powers for compulsory pasteurisation of milk. This has usually been based on the alleged rights of small traders, cost of plant, &c. The figures quoted in this communication are probably typical for any part of the metropolitan police area (covering 8,000,000 people) and indicate that there are in fact very few retailers who do not sell either pasteurised or otherwise safe milk, and that the total quantity of pasteurised or otherwise safe milk sold is a very high proportion of all milk sold. The time probably is at hand when standing committees on private bills, or even the Ministry, may be persuaded more easily to accept the principle of compulsory pasteurisation for all milk which is not otherwise bacteriologically controlled.

SUMMARY

1. The milk-supply of an outer London suburb with 50,000 population is analysed.
2. The milk consumption per head is just under 0·5 pint daily.
3. The amount of efficiently pasteurised milk sold is 82 per cent. of the whole.
4. The amount of "safe" milk sold is at least 86 per cent. of the whole.

5. The phosphatase test has been found useful in deciding whether a pasteurising plant is turning out safe milk.

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2. Howell, J. B.: THE LANCET, 1934, II., 1073.
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5. Med. Research Council, Spec. Rep. Ser. No. 101, H.M. Stationery Office, 1926.
6. Report on Diets in Poor-law Children's Homes: Memorandum on the Criticism and Improvement of Diets, H.M. Stationery Office, 1932.
7. Leighton and McKinlay: Loc. cit.
8. Private communication through Mr. H. E. Magee, D.Sc.

THE REFORM OF MEDICAL STUDIES IN ITALY

THE proposals of the commission nominated by the Italian Ministry of Education have been published in the Italian medical press. The report recognises the grave gaps apparent in the education of the present general practitioner, and finds as causes (1) the licence which permits students to attend their later studies before passing the earlier examinations; (2) the number of natural sciences taught in the first two years; (3) the number of examinations in special subjects in the last year; and (4) the lack of practical clinical training. The commission recommends that the medical curriculum of six years should be divided into three periods of two years. During the first anatomy and physiology are to be studied for two years, and chemistry, physics, and biology for a year apiece. The student must pass in all five subjects before being admitted to the study of the subjects of the second period. In their second period are two-year courses in (1) general pathology, (2) special medical pathology, (3) special surgical pathology, and (4) pathological anatomy and histology with a course of one year in pharmacology and materia medica. Again the student must pass in all five subjects before entering on the last period of his training. In the last two years there are 11 compulsory and three special subjects. The compulsory subjects are: (1) clinical medicine, and (2) clinical surgery, in each case a two-year course, to be followed by six months of practical training. Diseases of children, obstetrics and gynaecology, hygiene, and forensic medicine are each to be studied during one year. Nervous and mental diseases, skin and venereal diseases, eyes, throat, nose and ear, and dental disease are each to be taught in a course of 25 lecture-demonstrations. In addition, the student must select, and be examined in, at least three of the following extra subjects: (1) biological chemistry, (2) general histology and embryology, (3) microbiology, (4) parasitology, (5) experimental psychology, (6) tuberculosis, (7) tropical diseases, (8) orthopaedics, (9) radiology, (10) infectious diseases, (11) industrial medicine, (12) history of medicine, (13) urology, and (14) surgical anatomy and operative surgery. The instruction given in each of these subjects will also be in the form of 25 lecture-demonstrations.

It will be seen that the Italian student will now have to pass 24 examinations in order to obtain his degree in medicine and surgery. This is of interest to us as Italy is at present the only continental country whose medical degrees are registrable in this country.

ARTIFICIAL PNEUMOTHORAX CENTRES IN HUNGARY

ON behalf of the Hungarian sanatorium and dispensary doctors Dr. Sander Puder¹ has made a survey of pneumothorax treatment in the kingdom and of the centres where refills can be given. Questionnaires sent to hospitals, sanatoriums, dispensaries, and

practitioners—274 in all, of whom 60 per cent. replied—showed that at the end of 1933 there were 2183 cases undergoing collapse therapy. It seems that there are each year 20,000 deaths from tuberculosis which, at three open cases to a death, would make 60,000 cases of open tuberculosis in the country. At a modest estimate 30 per cent. of these, or 18,000 cases, might be suitable for that form of treatment. How desirable it is that they should get it is evident from Dr. Puder's statement that 60 per cent. of cases so treated lose their bacilli. Every medical institution in the country should, he thinks, have an artificial pneumothorax centre, and where there are none new dispensaries should be provided. There should be specialists at the centres where the first puncture should always be made, but practitioners could, after some special training, do the refills. The patients should if necessary have their travelling expenses paid, the cost of the scheme being met in equal shares out of the taxes, rates, and national insurance, with the help of a special tuberculosis stamp.

THE CLIMATE OF PENMAENMAWR

DR. DENNISON PICKERING, medical superintendent of Pandyffryn Hall, Penmaenmawr, writes: "During the spells of foggy and wintry weather which have occurred this winter the wireless and newspaper reports have described fog and wintry conditions as general, the only places specifically mentioned at various times as being free from such conditions being places in the south of England, particularly on the coasts. During the whole of this time, at Penmaenmawr, we have had no fog; snow on one occasion for a few hours only; frost perhaps four or five times, and only once lasting after breakfast time, and never more than a few degrees. There have also been a large number of bright sunny days.

"It seems hardly fair that this state of affairs on the North Wales coast should be passed over without comment, and that this district should be included in the general North Wales weather reports, which apply almost entirely to the inland mountainous districts. We are trying to obtain recognition of the fact that a portion of the North Wales coast enjoys a climate entirely different from the rest of North Wales, and comparing favourably with any other winter climate in the kingdom."

AN ARMLESS VIOLINIST

THE autobiography of Hermann Unthan, a German born without arms, is worth reading.¹ Thanks to the remarkable character of his father and to his own determination he learned, among many other things, to play the violin with his feet and finally succeeded in supporting himself as a vaudeville artist. The story of his travels makes an excellent story, and Unthan overcame his disability to such an extent that the reader, absorbed in following his adventures, will occasionally tend to forget its existence. There are a few crumbs for the anatomist and the surgeon interested in the training of the physically handicapped, but the chief attraction of the book is in the personality of its courageous author

CHILDREN IN TROUBLE

FRANKNESS in sex education is requisite for stemming sexual crime, not only by satisfying precocious curiosity and preventing early misconceptions of sex, but also by encouraging free discussion and sound thinking among adults. This is the wider aim of the Federation of Children's Moral Welfare Committees which, besides rescuing the victims of sexual perversion, provides speakers at meetings for mothers and social workers, and is willing to promote discussions in public-houses and working-men's clubs. The work is hindered by the passive resistance of uninformed people who regard it as

¹ Ujabb Szempontok a Tuberculosis Ellenküzdelemben, Budapest, 1935.

¹ The Armless Fiddler. By C. H. Unthan. London: George Allen and Unwin, Ltd. 1935. Pp. 287. 10s. 6d.

meddlesome. The Holborn, St. Pancras, and Hampstead committee, of which Dr. Alan Moncrieff is chairman, had 99 new cases to deal with in 1935; of these 33 were preventive, the remainder were nearly all the results of indecent assault. Some of the children, whose circumstances and temperament make it desirable, are sent to institutions, but the majority are kept under the supervision of workers. The committee has been able to ensure special accommodation for the children when they appear at police-courts and stations, and their examination by women doctors. There is a great need for voluntary workers, both men and women, and the hon. secretary will gladly receive offers at 7, Amptill-square, N.W.1.

ON BEING AN INVALID¹

THE musings of a musician whose practice of her art was hopelessly prevented by her condition of invalidism, make interesting reading, though many will be irritated with the extravagant terms of Monsieur Pierre Sanson's preface. The pages record the self-communings of the patient who appears to have been condemned to die by a famous professor in a few months or at longest in a year, but who none the less has survived for 15 years. The first section of the book entitled "The drama of the inner self" contains little that might not have been the experience of many chronically sick. The second part entitled "The drama of the environment" is more worth reading. Some of the sections on familiarity with disease, the obtuseness shown by the healthy towards it, the isolation from friendships, the risks of egoism, and the pain which may be inflicted upon the well by the ill contain much suggestive reading.

"CONTENTMENT"

Messrs. CIBA LTD., 40, Southwark-street, London, S.E. 1, have issued an ornamental calendar for 1936, adorned with a pictorial frontispiece of unintentional medical significance. It is a delineation of "a fine old English gentleman, one of the olden time," sleeping off his dinner, and the details supplied by the artist suggest why the well-to-do classes in the earlier days of the Georges had a shorter tenure of life than their descendants of to-day enjoy. The artist, Mr. W. L. Grace, has produced a costume picture of a hearty squire who has dined and wined according to the standards of his time, has laid down his churchwarden, has drunk a final glass of toddy, and is now sleeping off the results. The picture, which is thoroughly well painted, judging by an effective reproduction, is labelled "Contentment"; it ought to be labelled "Beware," for undoubtedly the self-indulgent gentleman is asking for much pathological trouble.

"CELLONA TECHNIQUE" is the name of a handbook published by T. J. Smith and Nephew Ltd. (Neptune-street, Hull), which describes the use of their Cellona bandages in the treatment of fractures and also in veterinary practice. The text mainly consists of selections from papers appearing in English medical journals, and nearly all the illustrations are reproduced from Mr. K. H. Pridie's article on plaster technique, published in THE LANCET last autumn (1935, ii., 680 and 732). The Cellona bandage contains 90 per cent. (by weight) of plaster-of-Paris; it is moistened in about 10 seconds and sets firm in 5-10 minutes. The standard widths are from 1 to 6 inches, and in addition Cellona plaster slabs, Cellona lacquer (for waterproofing), and Cellona hook tape are obtainable. The handbook concludes with an informative article on fracture treatment taken from the *Medical Annual* of 1935.

THE DENMAN THUMB-GRIP DEVELOPER is held in the closed hand in such a way that a spring knob

at one end is pressed inwards by the thumb. This exercises many muscles besides those of the thumb and finger, and it is claimed that nervous control as well as strength of hand and arm can be increased by keeping a pair in the pocket and gripping them occasionally. The training indeed may be helpful for golf or other games; but the producers (Denman Products Ltd., 169, Regent-street, London, W. 1) are perhaps unduly hopeful when they go on to suggest that the mental and physical concentration obtainable will "rebuild shattered nerves."

UNDER the title, "Suggested Standards for Milk Foods in Infant Feeding," Messrs. COW AND GATE LTD. (Guildford, Surrey) issue an attractive account of their aims and methods. They point out that their foods are prepared from Somerset and Dorset milk, and sold in sealed and dated tins. Poor or dirty milks produce powders which are low in solubility and high in acidity and do not keep well, and the Cow and Gate booklet describes the bonus schemes, farm inspections, and continual testing which ensure that the 9 million gallons used by the firm are fully satisfactory. Prepared by the "improved roller process" the powder is exposed to heat treatment at 98° C. for less than 3 seconds, and contains on an average 250 international units of vitamin D per pint of reconstituted milk, none being added artificially. Particulars are given of the 18 forms of dried milk manufactured, ranging from the standard full-cream and half-cream powders to such preparations as Caprolac, a goat's milk powder recommended for infants intolerant of cow's milk. Members of the medical profession are invited to visit the factories.

Births, Marriages, and Deaths

BIRTHS

- FOX.—On Jan. 8th, at Guernsey, the wife of Dr. Maurice D. Fox, of a daughter.
FRANKLIN.—On Jan. 15th, at Devonshire-place, W., the wife of Richard H. Franklin, F.R.C.S. Eng., of a son.
O'RIORDAN.—On Jan. 15th, at Plymouth, the wife of Surgeon Commander T. J. O'Riordan, R.N., of a son.
SNOW.—On Dec. 20th, at Poona, the wife of Captain J. E. Snow, R.A.M.C., of a son.
STEEL.—On Jan. 20th, at Hillingdon, Middlesex, the wife of Dr. W. Arklay Steel, of a son.
WILSON.—On Dec. 3rd, at Sydney, Australia, the wife of Dr. Harold Wilson, of a daughter.

MARRIAGES

- BLACK—CHRISTMAS.—On Jan. 17th, at St. Mary-le-Strand, Charles Black, M.B., Ch.B. Glasg., of Alexandria, Dumbartonshire, to Mary Elizabeth, daughter of Mr. John Christmas, Blythwood, Enfield.
DAY—BAILEY.—On Jan. 11th, at Jullundur, Punjab, India, Capt. Peter Leigh Day, R.A.M.C., to Jean Metcalfe Bailey.
MCMULLAN—WARD.—On Jan. 9th, at the Priory Church, Great Malvern, William McMullan, L.R.C.P., D.P.H., to Rosamund Mabel, only child of Mr. A. H. Ward, O.B.E., Great Malvern.
STEVENS—DAVIS.—On Jan. 11th, at St. Mary's Church, Twyford, T. Russell Stevens, F.R.C.S. Eng., Dorchester, only child of Thos. G. Stevens, F.R.C.S., to Enid, younger daughter of Mr. Stanley Davis.
SWAN—WHITE.—On Jan. 14th, at Ballymore Parish Church, Tandragee, Dr. William David Swan, son of the late Mr. John Swan and of Mrs. Swan, Ballyshannon, to Dr. Elizabeth Barrington White, younger daughter of the late Mr. T. H. White and of Mrs. White, Orange Hill, Tandragee.

DEATHS

- BERNARD.—On Jan. 19th, at Fishponds, Bristol, Claude Bernard, M.R.C.S. Eng., aged 67.
BOND.—On Jan. 18th, at Woodbridge, Suffolk, of pneumonia, Bertram William Bond, M.B. Durh., M.R.C.S. Eng., aged 67.
DOUGLAS.—On Jan. 20th, at Buckingham-gate, S.W., Stewart Ranken Douglas, F.R.C.P. Lond., F.R.S., youngest son of the late James Alexander Douglas.
FISHER.—On Jan. 10th, at Oreston, near Plymouth, Herbert Wortley Fisher, M.R.C.S. Eng., son of the late John Fisher, Inspector-General R.N., aged 59.
VERNON.—On Jan. 19th, at a nursing-home, Ethel Miller Vernon, M.D. Lond., of Millbank, S.W., eldest daughter of the late Thomas Heygate Vernon.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

¹The Glorious Bondage of Illness. By France Pastorelli. London: George Allen and Unwin Ltd. 1936. Pp. 224. 6s.

ADDRESSES AND ORIGINAL ARTICLES

THE SURGERY OF CORNEAL GRAFTS

WITH LATE REPORTS

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(WITH ILLUSTRATIONS ON PLATE)

THE latter half of the nineteenth century saw a rapid expansion in all branches of ophthalmic surgery, largely stimulated by the successful work of von Graefe and his pupils, and at this time great interest was taken in early experimental keratoplasty. Although de Quengsy in 1789 had mooted the idea of a transparent glass implant in the cornea, it was not until 1824 that Reisinger attempted to graft living cornea in rabbits. He was not successful, and further attempts by Mulbauer and Durr in 1877, also using rabbits, met with similar results.

A. von Hippel was the first surgeon to demonstrate, at the International Congress in Heidelberg in 1888, a successful case of corneal graft in a rabbit. He described two methods: (1) that in which a partial thickness of the cornea was employed (lamellar); (2) that in which the whole thickness of the cornea was removed (circumscribed penetrating) (Fig. I. *a* and *b*). He used a circular trephine of his own device but without any method of fixation of the graft. It is on this worker's pioneer technique that the modern operation of keratoplasty depends. The lamellar method, which appeared safer in those early days, was used by several workers, and the first successful case of human corneal grafting by it was demonstrated by Zirm in 1906, in a case of dense corneal scarring following a lime burn. Modifications followed in rapid succession. Lohlein in 1909 used a vertical strip of cornea together with attached conjunctiva. Wiener removed superficial scars and allowed the raw surfaces to epithelialise, but the method of partial keratoplasty was finally abandoned since the implants were not permanently transparent.

keratitis. Several patients were improved to a vision of 6/6. The technique of the operation constituted rigid preliminary aseptic routine, van Lint facial block, retrobulbar anaesthesia, and the Elschnig fixation suture (Fig. II.). A Hippel trephine was used to prepare the graft and the whole of the thickness without any bevelling of the edges was employed, the pupil being in a

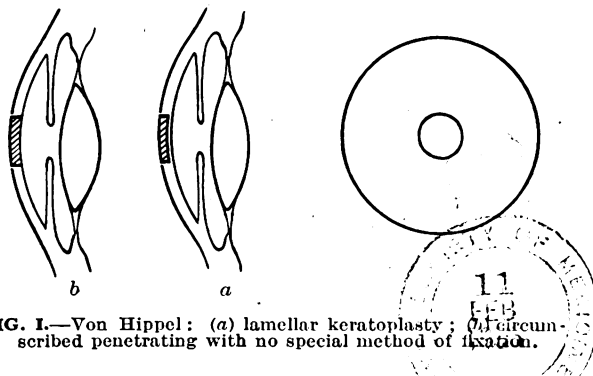


FIG. I.—Von Hippel: (a) lamellar keratoplasty; (b) circumscribed penetrating with no special method of fixation.

state of miosis. The size of the trephine was 4-5 mm. Thereafter the graft was kept between layers of dry gauze and fixation was obtained by a bridle suture running over the graft; in 22 cases, flaps also had to be employed (Fig. II.). The conclusions which Elschnig reached were that the penetrating method of keratoplasty was the method of choice, that the blood group of host and donor had no relationship to the subsequent transparency of the graft, that the graft could be removed from an eye which was not necessarily healthy provided it was transparent at the time of removal, and that the younger donors provide the better grafts.

Within the last five years there have been many modifications of this method. Filatoff uses ribbon flaps of conjunctiva to keep the graft in place, having previously protected the lens and iris by a strip of celluloid inserted behind it. Egg membrane is also used as a protective. Tudor Thomas (Fig. III.) bevels the edge of the graft and employs a slightly larger trephine to cut the bed. Olive oil is used as a vehicle and protective dressing, and corneal

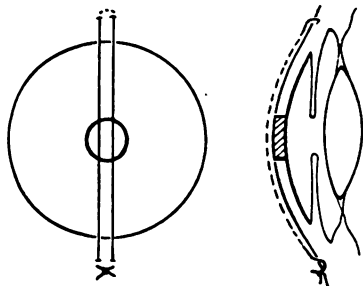


FIG. II.—Elschnig: Circumscribed penetrating keratoplasty with bridle fixation suture. Miosis.

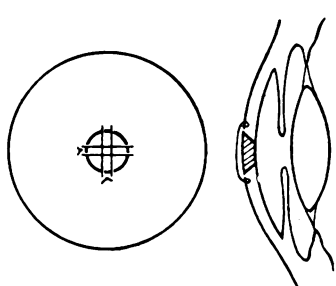


FIG. III.—Thomas: Corneal fixation suture, bevelled graft. Miosis.

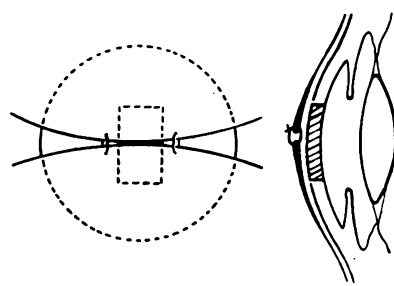


FIG. IV.—Castroviejo: Rectangular graft. Vertical flap.

About the year 1910 Elschnig and his assistants commenced a series of operations which in 1930 had reached a total of 172 cases. Their results, which have never been surpassed, removed the operation of keratoplasty from the experimental to the therapeutic stage. These workers claimed successes—that is to say, clear corneal grafts—in 22 per cent. of all cases and in 73 per cent. of cases of interstitial

sutures are used for fixation (Fig. III.). Castroviejo uses parallel knives and cuts a rectangular graft using conjunctival flaps for fixation (Fig. IV.). The procedures of Morax and Kraupa should be noted at this stage (Fig. V.). Morax employs auto-transplants from the same cornea. This is necessarily of the lamellar type, and there is an interchange of corneal discs so that the opaque disc is placed at the

periphery and a clear disc is placed over the nebula. Kraupa employing the circumscribed penetrating method rotates the graft, which is composed partly of scar tissue and partly of clear cornea. Rotation brings the clear segment of the graft into the pupillary line and

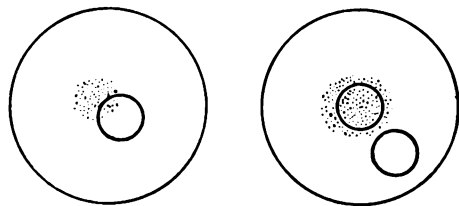


FIG. 5.—(a) Kraupa: Rotation of graft. (b) Morax: Transposition of graft. Lamellar method.

diverts the scarred portion to the periphery. Key had attempted to graft the whole of the cornea but without success.

The Author's Method

I employ the following method (Fig. VI.). A general investigation of the host and donor is undertaken; gross focal sepsis is removed and general disease eliminated; the Wassermann reaction in the donor must be negative. There must have been no active disease in the eyes for at least a year before keratoplasty can be undertaken. The usual preliminary cataract precautions are taken such as ensuring patency of the lacrimal ducts and sterility of the conjunctival sac; there must be no severe cough or prostatic obstruction. Preliminary treatment is carried out for one week, with four-hourly irrigations of hydrarg. oxycyanide lotion 1:8000, together with local ultra-violet radiation of three minutes' duration daily by the full spectrum of the mercury-vapour lamp. The projection of the eye is accurately measured and the response must be brisk. Retro-illumination determines the position of the pupil and the presence or not of gross lens opacities; this is important in determining the precise site for the graft. On the day before operation the state of the bowels is attended to in the usual way, and atropine is instilled at night into the host's eye. I have given up the use of miotics for reasons stated later. On the morning of operation Medinal grs. 7½ is given one hour before the projected time of operation. The patient is operated on in bed and not lifted on to an operating table.

OPERATION

The preparation of the site in the host and the enucleation of the donor's eye are begun simultaneously. Anæsthesia is obtained by 4 per cent. cocaine and retrobulbar injection of novocain with adrenaline so as to reduce the tension of the eye and prevent expulsion of the intra-ocular contents. Facial akinesis by the method of O'Brien is a routine procedure. In the host a complete flap is prepared circumscribing the limbus and separated well back to the equator of the globe. A purse-string suture (No. 1 black silk Mersuture) is inserted close to the edge of the conjunctiva in such a way as to render the aperture eccentric when tightened. A 4 mm. circular graft is delineated over the precise site of the pupillary aperture which has previously been determined and may have been marked on the nebula by methylene-blue (Elschnig), and the whole thickness of the cornea is cut through. In early cases I practised the shelving method of Tudor Thomas but recently I have abandoned this because there is little risk of losing the disc, and the shelf of up to 1 mm. reduces the available portion for vision of the 4 mm. graft to 2 mm. posteriorly and there is

a risk of Descemetitis covering this small aperture later. During these manœuvres the eye is constantly irrigated by normal saline at body temperature, and when the graft is cut through in one portion the aqueous is slowly evacuated, and the section completed by scissors and fine protected forceps. The same procedure is carried out in the enucleated eye using Tudor Thomas's apparatus for holding the globe.

The graft is then transferred to normal saline lotion at body temperature, and from there to the bed by means of a lens spoon, care being exercised to see that it is not turned upside down. It is manœuvred into position by means of the iris repositor, the assistant at the same time gradually tightening the purse-string suture so that the graft gradually disappears from view as the conjunctiva closes over it. When the conjunctiva is tied off and allowed to fall back the graft is held securely in position by the natural strap over the cornea. No suture touches the graft since it is entirely covered by conjunctiva. A retention stitch fixes the upper lid to the cheek and ordinary postoperative cataract routine is instituted.

Aspirin, grs. 10, is given after the operation, and as a rule there is no pain and very little discomfort. The eye is not dressed for three days, after which the graft usually appears opaque and can be dimly seen through the widening conjunctival aperture. At the end of the first week more of the graft is visible, and it is slowly beginning to clear; on the tenth to the fourteenth day the stitch either cuts out or is removed and the conjunctiva slides back. Atropine mydriasis is continued from the first dressing. It is of importance to keep the patient in bed for at least a month, since the linear scar is weak and there is a tendency to prolapse if the patient in his enthusiasm attempts to do too much.

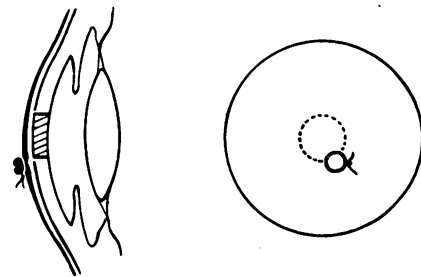


FIG. 6.—Rycroft: Circumscribed penetrating keratoplasty. Complete conjunctival flap. Mydriasis.

INDICATIONS

Indications for the graft of a cornea are clearly defined.

- (1) Vision must be reduced, to perception of hand movements, by a corneal scar.
- (2) Uveal tissue must not adhere to the scar; this must be separated off before a graft is undertaken.
- (3) The pupillary aperture must be bright and mobile by retro-illumination, although successful cases of graft have subsequently had a cataract removed.
- (4) Glaucoma must be absent.
- (5) The projection of light must be accurate and brisk.
- (6) There must be an absence of disease in the host and of syphilis in the donor.

Suitable cases result from chemical burns, healed interstitial keratitis and corneal ulceration without iris prolapse, and the definition of a successful case is that the graft is in place one year after operation and has retained transparency throughout that year with a maintenance of vision. Filatoff put the period of nine months. Donor grafts may be obtained from

cases of sarcoma, detached retina, absolute glaucoma without oedema, old iritis, and cases of recent injury.

OPERATIVE COMPLICATIONS

1. *Prolapse*.—In one case a large graft of 6 mm. was used and a prolapse occurred at the end of the first week. This was excised satisfactorily but the transparency of the graft was affected by the trauma. With 4 mm. grafts there has been no prolapse, and it would appear that a larger wound takes longer to heal and the risk of prolapse is correspondingly greater. Furthermore I now employ mydriasis as the preventive before, during, and after the operation, since with the loss of aqueous the pupil contracts in any case and protects the lens so that miosis seems to be unnecessary; it appears to favour incarceration of the iris in the wound two or three hours after operation.

2. *Difficulty of fixation of the graft*.—I now use a complete graft without bevelling of the edges following the method of Elschmig, who had only 1 misplaced graft in 172 cases. Furthermore this shelving tends to make the accurate fixation of the graft difficult and certainly diminishes the posterior visual aperture of the cornea and increases the linear scar area. Corneal sutures predispose to a localised opacity and cross stitches may interpose themselves between the lips of the graft (Castroviejo). The object of the complete conjunctival flap as described is to give a uniform pressure over the graft with an absence of irritating foreign substances. The swelling of the graft rapidly fixes it in position in the cornea, and the same size of trephine is used for host and donor.

3. *Sepsis does not occur frequently*.—Elschnig gives one case of necrosis in his series, and with careful preliminary technique it is possible to avoid this, especially if the site of the graft is carefully covered by conjunctiva.

4. *Opacification of the graft*.—There are three types of opacity. The first comes on during the first week, and is the result of the imbibition of aqueous humour into the substantia propria; it rapidly clears up towards the end of the first week. The second is due to vascularity from the spread of superficial vessels towards the end of the second week; this takes longer to clear but is not permanent. The third opacification comes about the end of the first fortnight, and is due to a failure of nutrition in the graft, and is permanent. In successful cases the area outside the graft also clears to a certain extent.

The Use of Animal Grafts

For many years the earlier workers were hampered by the limitations of their material. Von Hippel employed grafts from rabbits and dogs without success. This has been often repeated with the same results up to the present day, and it appears quite definite that grafts from animals cannot be successfully employed in the human. Grafts from cadavers may be employed provided they are taken within an hour of death as described by Filatoff. Magitot has kept a graft transparent for four weeks in hamolysed serum. Salzer and Ortin after many experiments have come to the conclusion that autotransplants—i.e., transplants from the same person or same cornea (Kraupa, Morax)—are best, that homotransplants from the same species may be successful, but that heterotransplants from different species are never successful. Tudor Thomas has reported the use of devitalised corneal tissue in rabbits and has pointed out that there is a general firm union with the thinning of the linear scar and very little reaction.

Illustrative Cases

The following three cases are examples of corneal grafts after six, nine, and twelve months.

CASE 1.—A man, aged 52, in 1930 had a severe attack of interstitial keratitis of the right eye and was treated by Mr. N. L. Pines who recommended the removal of unerupted wisdom teeth. The result of this operation was that the acute condition subsided, and in 1932 the eye became quiet with a vision of perception of light (Fig. VII. a on Plate). In May, 1935, keratoplasty was decided upon, although the condition was unilateral, and preliminary investigation was undertaken. For many weeks conjunctival culture showed *Staphylococcus aureus* until finally, by vigorous ultra-violet radiation, silver nitrate, and the usual applications, a clean culture was obtained. A 4 mm. graft was employed, the donor being a woman who had suffered complete retinal detachment and old iritis. The patient has made an uninterrupted recovery and six months later is able to go about by the aid of this eye alone which has vision of 6/60 and a full field. Colour vision is normal, and he is able to read the headings in a newspaper. The cosmetic result is excellent and the graft is steadily clearing (Fig. VII. b).

CASE 2.—A woman, aged 49, has suffered since the age of 7 from ulceration of both eyes and was treated for some years by curettage of the cornea and instillations of dionine. Since 1930 there has been no treatment. On admission to hospital for keratoplasty both corneae showed a central nebulae of medium density; vision was perception of light, and in each eye there was no organic disease of the patient. The tension of the right eye was 30 and of the left 26, and the left was accordingly chosen for corneal graft. With the technique described, using a 6 mm. graft, keratoplasty was carried out. Five days after the operation the patient was able to see a dim form in a bed across the ward, to make out the windows of the ward, and to see chimneys on adjacent houses. But on the tenth day there was a prolapse of the iris which had to be excised. Thereafter the transparency of the graft failed and the vision to-day has been reduced to counting of fingers, which was better than it was before the operation.

CASE 3.*—The third case was shown to the section of ophthalmology, Royal Society of Medicine, in January, 1935. The patient was a woman, aged 48, who had had the right eye removed for tuberculous keratitis, and whose left cornea showed healed opacity which had reduced her vision to perception of light (Fig. VIII. a on Plate). She had been certified for the Blind Register and had ceased treatment in November, 1934. Complete investigation was carried out, and a 4 mm. corneal graft was obtained from an accident case and inserted into the patient's cornea by the above method. Convalescence was uneventful, and we demonstrated the case at a vision of 6/24 with correction and J 6 (Fig. VIII. b). One year after operation the graft has still maintained its transparency; there is a good deal of thickening of Descemet's membrane on the posterior corneal surface but the pupillary gap remains wide enough to afford a vision of 6/36; the anterior chamber and iris are seen to be normal. There is no ectasia of the scar and the tension is normal. Vascularisation is absent except for a few superficial conjunctival vessels.

During the last year the patient has gone about the streets on her own and made bus journeys alone. She is able to read newspapers and write good manuscript. She attends and enjoys the cinema, and is able to do her own housework. For reading fine print, J 4, she employs telescopic spectacles, but for ordinary purposes the unaided eye is used. She reports that she finds it difficult to express her feelings at being able to see again after having resigned herself to a life of blindness.

I have received much valued assistance from the senior house surgeons at the Royal Eye Hospital, Mr. G. Handelsman and Mr. R. H. Rushton who were responsible for the preliminary investigations and for assistance during the actual operations; to them I am gratefully indebted.

* The history of this patient up to last March has been recorded in the British Medical Journal (1935, i., 919).

(Bibliography at foot of next page)

EFFECT OF SEX HORMONES ON THE PROSTATE OF MONKEYS

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I.—The Effects of Male Hormone

ALTHOUGH a beginning has been made in the clinical use of male hormone preparations, our experimental knowledge of the effects of the hormone on the accessory reproductive organs relates only to small rodents. The present investigation on immature monkeys provides information about corresponding effects on accessory reproductive organs homologically similar to those of man.

Such an investigation does not appear to have been made as yet, and indeed there have been practically no studies even of the secondary sexual characters of monkeys and apes, in many species of which they are exceptionally well marked. Antonius¹ reports that the very conspicuous cape of hair of male hamadryas baboons disappears, and the pelage changes to the female type after castration. We can confirm his statement on the basis of a similar experiment of our own, but apart from these two observations, we know of none that relates to the endocrinology of the testis in subhuman primates.

INVESTIGATION

Material.—Seven normal immature male rhesus monkeys (*Macaca mulatta*), whose weights and approximate ages are given in Table I, were used in this study. One was injected daily with 10 capon units* of "Enarmon" urine concentrate, for which we thank Dr. Itoh, Teikokusha Institute, Kawasaki. Three were injected with an oil solution of "synthetic" androsterone,² and three with an oil solution of "synthetic" androstanediol³ (di-hydroandrosterone). (See Table I.) For both these prepara-

* At the time this assay was made no standard of reference was available, but 1 "capon unit" as then used by us is now known to correspond almost exactly to the activity of 100 γ of androsterone, the prospective international unit of male hormone activity.

tions we are greatly indebted to Prof. L. Ruzicka and Messrs. Ciba Ltd.

An extensive control series of normal animals was available.

TABLE I

Administration of Male Hormone to Immature Male Rhesus Monkeys

No. of animal (M.M.).	Body-weight (g.).	Approx. age in months.	Nature of preparation.	Amount injected daily.	Days injected.	Total units given.
10	3200	38	"Enarmon."	10 c.u.	10	100
24	1800	20	Androsterone.	10 mg.	10	1000
30	2700	24		2.5 "	22	550
31	2700	24		5 "	22	1100
52	2700	24	Androstanediol.	5 "	12	1800
53	3800	24		5 "	20	3000
78	2680	24		5 "	28	4200
				5 "		

EXPERIMENTAL RESULTS

External changes.—Swelling and coloration of the skin of the external genital organs, anus, and surrounding areas, such as develop during injection of oestrone, did not occur during any of the present experiments with male hormone. The external genitalia were unexceptional in all the monkeys except M.M. 53, which differed from the other experimental animals in that its testes at autopsy were at the base of a well-developed scrotum. Since, however, the testes were still undescended in M.M. 78, in which injections of androstanediol were continued for longer than in the case of M.M. 53, it is difficult to ascribe the position of the testes in the latter to the injections, and it is possible that the animal had already reached the age for testicular descent.

There was a suggestion in the behaviour of M.M. 78 that its responses became more aggressive, and its social position in the cage, which it occupied with two other males of the same age, more dominant towards the end of the treatment.

Internal changes.—With the exception of M.M. 10, the prostate and seminal vesicles of all the injected animals are larger than those of the normal controls. The seminal vesicles show the usual characters associated with the administration of male hormone in rodents⁴ and need not be discussed here. Essentially they comprise rapid glandular development, and a relative and parallel decrease in the fibromuscular tissue (Fig. 1). The degree of response roughly corresponds to the number of units administered.⁵

The prostatic changes are confined to the prostatic glands proper and to their fibromuscular stroma, and,

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as with the seminal vesicles, the degree of response is roughly proportional to the number of units administered. The muscle cells and nuclei are more swollen than is normal, and mitoses are frequent in the stroma, which is also unusually vascular.

The prostatic glands, especially in those specimens which had been injected with androstanediol, are much larger than normal. The increase in their size can be attributed mainly to an increase in the size of the cells of the glandular epithelium. These cells, especially in the best developed glands, are much larger and more regularly columnar than in the normal, with oval basal nuclei and a conspicuous inner zone of cytoplasm. The cells do not characteristically show a central paler zone in the inner cytoplasm such as is described in the rat after treatment with male hormone,⁶ but this may be due

to the fact that no special technique was followed in the staining of the sections, which were treated with Meyer's hæmalum and eosin. Although the glands are more open than in the controls, and contain more secretion, they are not in any specimen as dilated as in fully mature male primates. Moreover, although there are numerous mitoses in the glandular epithelium, it is doubtful whether the number of individual glands is greater than in the control material (Fig. 2).

In none of the experimental animals are there any changes in the utricular epithelium, epithelium of the terminal parts of the common ejaculatory ducts, or epithelium of the dorsal part of the lower half of the prostatic urethra, tissues which respond to œstrone.

CONCLUSION

The essential changes occasioned by male hormone in the seminal vesicles and the prostate of the

immature monkey are similar to those which occur in the true prostatic tissue of rodents—i.e., the hormone promotes rapid growth in the size of the organs by acting both on their fibromuscular stroma and on their individual glandular elements, which are rapidly transformed to a mature type. In its lack of influence on the epithelium of the uterus masculinus, which responds to œstrone, male hormone obeys the principle laid down by Moore and Price⁷ that "gonad hormones stimulate homologous reproductive accessories, but are without effect upon heterologous accessories"

The small number of specimens studied and the difference in the treatment of the various animals make it difficult to compare the relative potencies of the various preparations used, but the maturest

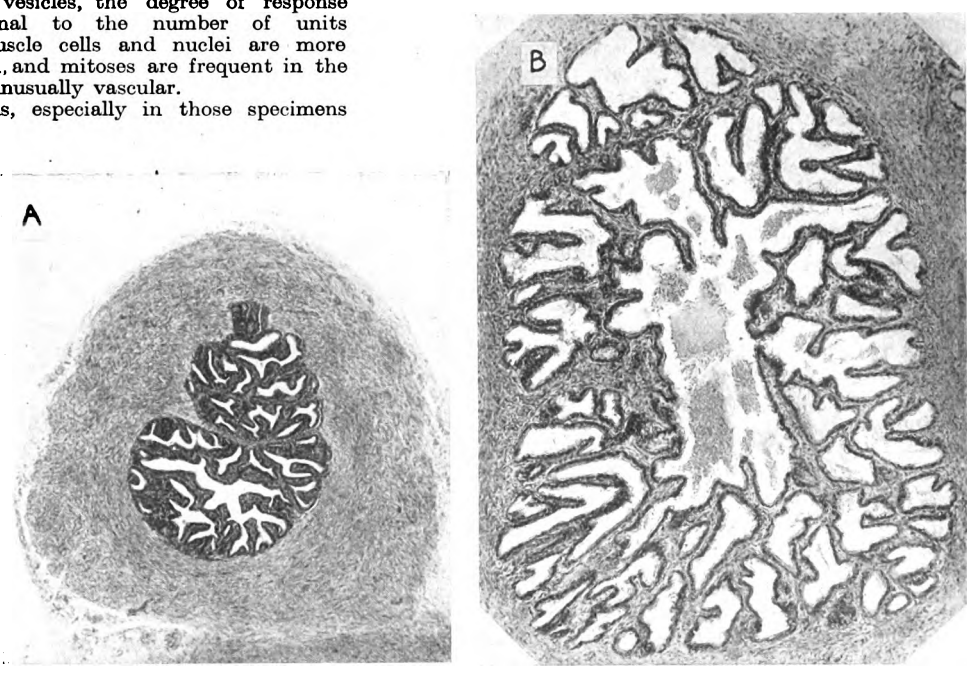


FIG. 1.—(A) Seminal vesicle of immature normal rhesus monkey (MM. 11). (B) Seminal vesicle of immature rhesus monkey (MM. 53) after injection of androstanediol (see Table I.). (× 47.)

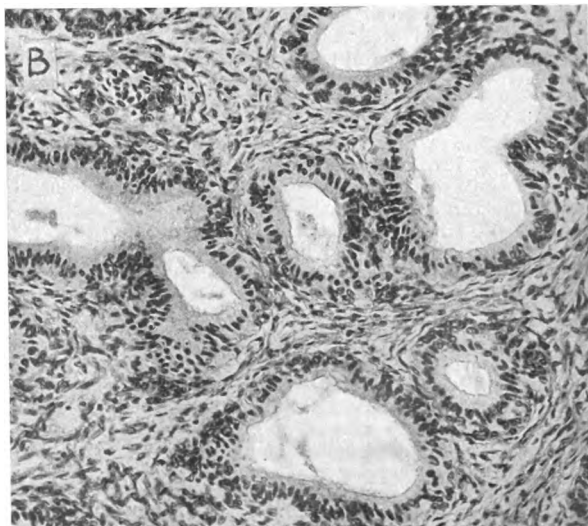
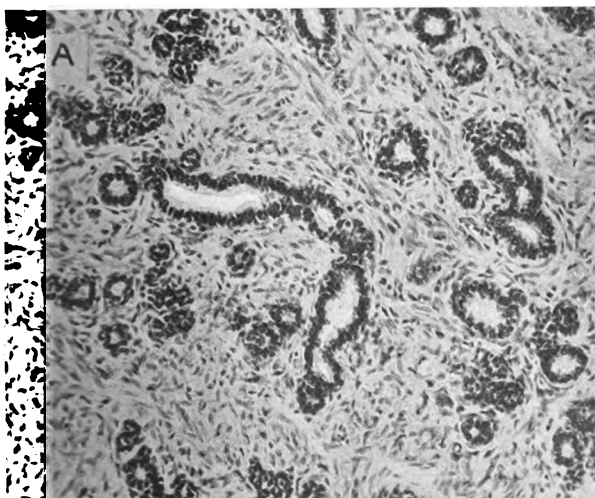


FIG. 2.—(A) and (B) prostates corresponding to seminal vesicles in Fig. 1. (× 157.)

prostates were those of the animals injected with androstanediol. The animal injected with enarmon, on the other hand, showed very few changes. Although the activity of enarmon on rats per capon unit is at least three times that of crystalline androsterone, the lack of effect in the present instance is not surprising, since the total amount of enarmon injected could not have equalled in potency much more than 30 mg. of androsterone.⁸

II.—Suppression of Effects of Œstrone by Simultaneous Administration of Male Hormone

The possibility that the epithelial changes induced by Œstrone in the prostate of monkeys⁹ may throw light on the aetiology of glandular hyperplasia of the prostate in man makes it urgent to inquire whether or not these changes in the monkey can be inhibited by male hormone, in the same way as similarly induced changes in the prostate of mice.¹⁰⁻¹² The immediate importance of this problem lies in the homological similarities of the monkey and human prostates, and in the present uncertainties as to the true relationship of the organ called prostate in mice to the primate organ of the same name. The general significance of the problem is complicated by the doubt as to the nature of the Œstrogenic substance found in the male mammal. Esterified Œstrone is certainly excreted by the stallion, but whether or not it is by other male mammals is unknown. Biological examination of testis extracts¹³ suggests strongly that the Œstrogenic substance elaborated by the bull is neither Œstrone nor Œstriol. Moreover, one of the two compounds possessing male hormone activity which have been isolated from human male urine (trans-dehydroandrosterone) is Œstrogenic (Butenandt¹⁴), and the Œstrogenic property of human male urine may be partly or wholly accounted for by its presence. Whether or not trans-dehydroandrosterone can produce prostatic effects in the male primate similar to those of Œstrone remains to be seen. Our first experiment has proved negative (MM. 80).

The present investigation deals with a group of monkeys in three of which the effects of Œstrone were undoubtedly inhibited by means of male hormone.

INVESTIGATION

Material.—Five immature male rhesus monkeys, whose weight and approximate age are given in Table II., were used. Two received an oil solution of "synthetic" androsterone as well as an oil solution of crystalline Œstrone. The remaining three animals received an oil solution of androstanediol (di-hydroandrosterone) which is three or four times more potent on castrated rats than androsterone, in addition to the Œstrone. These two male hormone compounds were available through the courtesy of Prof. Ruzicka and Messrs. Ciba Ltd.

Injections were made once daily for the periods indicated in Table II., and autopsies were made on the day after the last injection. Preparations from normal male rhesus monkeys and from male monkeys injected with similar amounts of Œstrone alone and with similar amounts of male hormone alone were available as controls.

EXPERIMENTAL RESULTS

External changes.—Only MM. 55 presented any clear evidence that the external effects of Œstrone had been suppressed by the male hormone. The other four animals all showed marked œdema of the scrotum and anus, as well as swelling and coloration of the surrounding skin. In MM. 55 the swelling was practically restricted to the anus, and in view of the internal condition (see below) there seems little doubt that the androstanediol with which this animal was injected had in some way prevented the Œstrone from producing its usual external effect.

Prostatic and urethral changes.—The prostate, uterus masculinus, and upper urethra in MM. 32 and MM. 33 are not different histologically from corresponding tissues taken from animals injected with Œstrone alone. In both cases the prostate is much larger than in normal animals of the same age, and there is considerable stratification of the utricular epithelium. The general prostatic stroma appears to be relatively increased in amount, and the prostatic glands in no way resemble the glands of monkeys injected with male hormone alone. The urethra also shows the typical stratification induced by Œstrone.

MM. 55, MM. 57, and MM. 74, on the other hand, show the characteristic prostatic changes associated with the administration of male hormone alone, and do not present any specific features which could be ascribed to the action of Œstrone. Thus the uterus masculinus in all three is normal in appearance, its epithelium varying between one and three cells deep (Fig. 3). Similarly, the urethral epithelium is normal and completely unlike the heavily stratified epithelium found in the urethra following the injection of Œstrone alone.

On the other hand, the prostatic glands are much more conspicuous than those of normal animals of the same age. The individual glands are larger and more distended, and characteristically lined by regularly set large columnar cells with basal nuclei. Mitotic figures are numerous, both in the glandular tissue and in the fibromuscular

TABLE II

Simultaneous Administration of Male Hormone and Œstrone to Immature Male Rhesus Monkeys

No. of animal (M.M.)	Body-weight	Approx. age in months.	Amount of Œstrone daily (γ).	Nature of male hormone.	Daily amount.	Days injected.	Condition of uterus masculinus.
32	(g.) 2700	24	200	Andro-sterone.	(mg.) 2.5	16	Extensive stratification.
33	2700	24	200		2.5	16	
55	2500	21	100	Andro-stanediol.	5.0	14	Normal.
57	2800	25	100		5.0	14	
74	2580	28	100		5.0	14	

stroma. As with most male monkeys injected with Œstrone and male hormone, either separately or together, the prostate is much bigger in these three animals than in normal controls of the same weight and age. The prostate of MM. 74 is almost twice as large as that of a control animal slightly heavier than itself.

DISCUSSION

The absence in MM. 55, MM. 57, and MM. 74 of any of the characteristic prostatic epithelial changes induced by Œstrone can leave little doubt that androstanediol in the proportions given (50 parts by weight to 1 part by weight of Œstrone) is able to inhibit the prostatic effects of Œstrone. Although it is well known, as we have already noted, that androstanediol is a more potent form of male hormone than androsterone, our experiments do not permit the conclusion that it is more potent in suppressing the effects of Œstrone, since we employed relatively four times as much androstanediol as androsterone per unit of Œstrone. It is also uncertain whether androstanediol has a specific effect in suppressing the changes induced by Œstrone. Probably other compounds of the androsterone-testosterone series would have the same effect if given in adequate amounts. There is also some indication that progesterone may have a similar antagonistic effect (see below). The actual mechanism by which Œstrone is prevented from exercising its normal effects by androstanediol is a matter for conjecture, and it is of interest that the hormone did not suppress all the effects of

œstrone in our experiments. Animals MM. 57 and MM. 74 showed prominent external changes, and this implies that the œstrone threshold of the skin of the scrotum and of the surrounding parts of the rhesus monkey is lower than that of the prostate. It may, however, be noted that the seminal vesicles of the present experimental

group of monkeys roughly corresponded, from the point of view of suppression of œstrone effects, to the prostates.

Our data do not allow any clear inference as to any possible synergistic action of œstrone and male hormone. In those cases in which the effects of œstrone were dominant (MM. 32 and MM. 33) there were no changes which could be clearly ascribed to male hormone, and the reverse also holds (MM. 55, MM. 57, and MM. 74). The only effect common to both groups of animals in our present experiments is the increase in the size of the prostate itself and in the amount of fibromuscular stroma, and this is an effect also obtained when either œstrone or male hormone is given separately. In failing to demonstrate a synergistic relation between œstrone and male hormone, our relations are in harmony with those of Moore⁶ and Callow and Deanesly⁸ on the seminal vesicles and prostate of rats, but in some disagreement with observations made by Freud,¹⁵ Korenchevsky and Dennison,¹⁶ and Overholser and Nelson.¹⁷

Male hormone is not only able to inhibit the prostatic effects of œstrone when injected simultaneously with the latter; as the following experiment shows, it can also cause the disappearance of

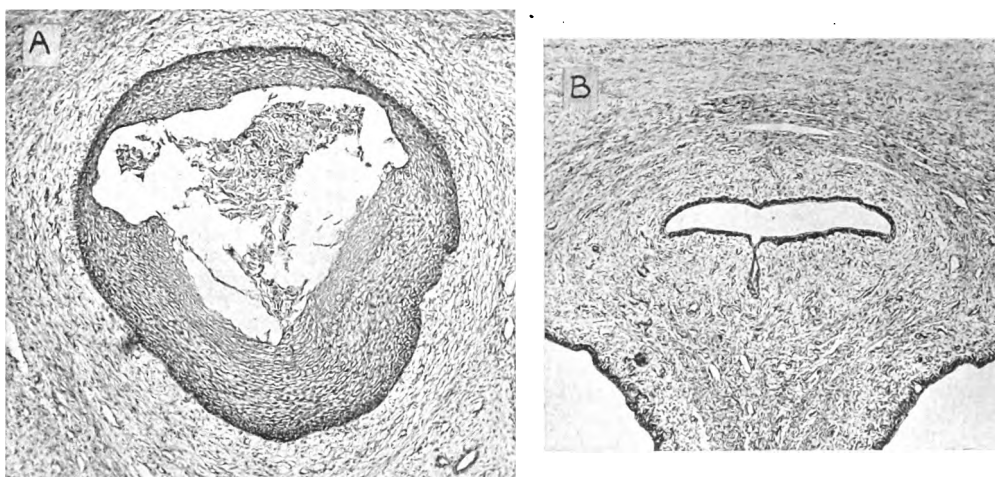


FIG. 3.—(A) Uterus masculinus of rhesus monkey (MM. 77) receiving 100 γ œstrone daily for 14 days. ($\times 47$.) (B) Uterus masculinus of rhesus monkey (MM. 55) receiving 100 γ œstrone plus 5 mg. androstanediol daily for 14 days. ($\times 47$.)

already established prostatic changes induced by œstrone, even in spite of the latter's continued administration.

Two immature rhesus monkeys, MM. 81 and MM. 82, both 3 kg. in weight and about 2½ years old, were injected with 100 γ of œstrone daily for 67 days. From the 29th day of the experiment, by which time the prostatic changes induced by œstrone would have been well established, until the end of the experiment 39 days later, MM. 81 was given, in addition to the œstrone, 5 mg. of androstanediol daily. The first effect of this additional treatment was the diminution of the swelling and coloration in the circumgenital and circumanal skin, which was very pronounced in both animals after the first 28 days of œstrone. As the experiment proceeded these external changes became less and less conspicuous in MM. 81, and at the close the scrotum and surrounding skin were almost normal in appearance. On the other hand, the external response became more and more extensive in MM. 82, which was on œstrone alone.

The prostates of the two animals showed corresponding differences. That of the monkey which had received only œstrone showed very advanced changes induced by this treatment.⁹ For example, the uterus masculinus had grown enormously, and its wall had become excessively thick. In contrast to this, the prostate of the animal which had been given male hormone as well was manifestly healthy, and provided an excellent picture of the effect

male hormone has on the prostatic glands of the immature monkey. Practically no sign remained of the changes which must have been produced during the first 28 days of the experiment when œstrone alone was administered, nor was there any evidence that the œstrone injected during the last 39 days had had any effect. Except at its blind tip and at its mouth, where the epithelium was slightly deeper than normal, the uterus masculinus was no different from that of an unjected animal. The urethral epithelium, too, though still

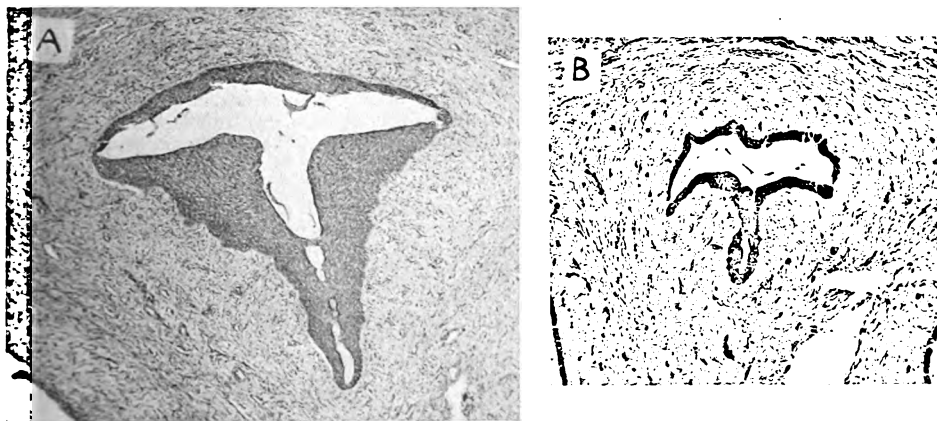


FIG. 4.—(A) Uterus masculinus of rhesus monkey (MM. 49) receiving 50 γ œstrone plus 300 γ progesterone daily for 14 days. ($\times 47$.) (B) Uterus masculinus of rhesus monkey (MM. 65) receiving 50 γ œstrone plus 1 mg. progesterone daily for 14 days. ($\times 47$.)

tions so far. A sixth tumour was found in a castrated male mouse of this strain which had been painted with keto-hydroxy-œstrin for 19 weeks. An apparently paradoxical result is that none of the females of this strain developed a tumour after treatment with œstrin lasting for more than 6 months, although tumours appear in 60-70 per cent. of untreated females of this strain when they are over six months old. Of the mixed strain, neither the males nor the females have so far developed a tumour.

The results confirm the observations of Lacassagne,¹ who first demonstrated the appearance of mammary carcinoma in male mice by injections of œstrin. While these experiments were in progress, Burrows² has also recorded the development of mammary cancer in 2 male castrated mice out of 20 mice of a mixed strain, after painting the skin with œstrin for a period of 25 weeks and 41 weeks respectively. No tumour had appeared in 110 male non-castrated mice of the same strain, which showed a very low incidence of spontaneous mammary tumours in the female. In our experiment, the œstrin-painted mice

demonstrates equally clearly the importance of the extrinsic carcinogenic factor, in this case œstrin.

4. The sensitiveness of the male mamma in its carcinogenic response to œstrin, contrasted with the great insensitiveness to œstrin of the female mamma in animals of a pure strain in which the female mamma develops cancer spontaneously in a very high percentage, suggests that either the female organism is able to destroy effectively the excess of œstrin administered experimentally, or that the carcinogenic response of the mammary epithelium depends on an indirect and not on a direct interaction between œstrin and the cells.

The second object of this communication is to record the occurrence of changes after the prolonged administration of œstrin which extend beyond the sex organs and which have not been recognised previously. It was found that an outstanding change in mice treated with œstrin over a prolonged period was the complete disappearance of fat, in fact a condition of cachexia. There were also extensive degenerative changes in the adrenal (Fig. 6), with active secretion of adrenaline by the medulla, and a hypertrophy in the islets of Langerhans. These

EXPLANATION OF PLATE

FIG. 1.—Naked-eye view of pituitary gland of normal male mouse, showing size and relation of gland to the optic nerves.

FIG. 2.—Naked-eye view of pituitary gland of male mouse of D.Z. strain after 6 months' painting with œstrin (Ref. No. 202 in Table of text), showing intense congestion of the pars anterior and compression of optic nerve.

FIG. 3.—Section through anterior lobe of gland illustrated in Fig. 2, showing large hæmorrhagic areas.

FIG. 4.—Section through anterior lobe of normal mouse pituitary at a magnification slightly higher than in Fig. 3, to illustrate degree of enlargement of the adenoma.

FIG. 5.—Section through testis of a mouse after 6 months' application of œstrin, showing absence of spermatids and spermatozoa, and arrest of the process of cell division, so that practically all the cells are immobilised in mitosis.

FIG. 6.—Adrenal gland of a male mouse after 5 months' application of œstrin. Osmic vapour fixation. Round masses of degenerating cells are conspicuous around the medulla. In a more advanced stage they almost completely replace the medulla. There is active secretion of adrenaline in the medulla.

showed the extensive changes in the uterus and vagina in the females and the atrophy of the testicles in the males which have been described previously. Scrotal hernia was observed to occur only in the males of the high cancer strain. The histological examination of the testis disclosed a condition which does not appear to have been described previously: œstrin inhibits the formation of spermatids and of spermatozoa and at the same time arrests division in the primary and secondary spermatocytes, the great majority of which present themselves in the process of cell division (Fig. 5). Œstrin therefore appears to arrest the process of cell division in the testis.

These results will be described in greater detail in a separate publication. For the present we wish merely to emphasise the following conclusions as being of general significance:—

1. Œstrin is absorbed by the unbroken skin without producing in it any carcinogenic effect.

2. Unlike the other carcinogenic substances so far studied experimentally, the carcinogenic effect of œstrin is restricted to a tissue remote from the site of application of the carcinogenic agent, but possessing a specific physiological sensitiveness to it. The action of œstrin resembles that of the other carcinogenic agents in producing first a hyperplasia of the tissue in which the cancer subsequently develops—the precancerous condition—and in the long period of time necessary to induce cancer.

3. The striking difference between the carcinogenic response to œstrin of male mice belonging to two different strains demonstrates clearly the importance of the factor "susceptibility," which in this case is genetic in origin, in the aetiology of cancer. The fact that cancer develops here in a site in which it never appears spontaneously

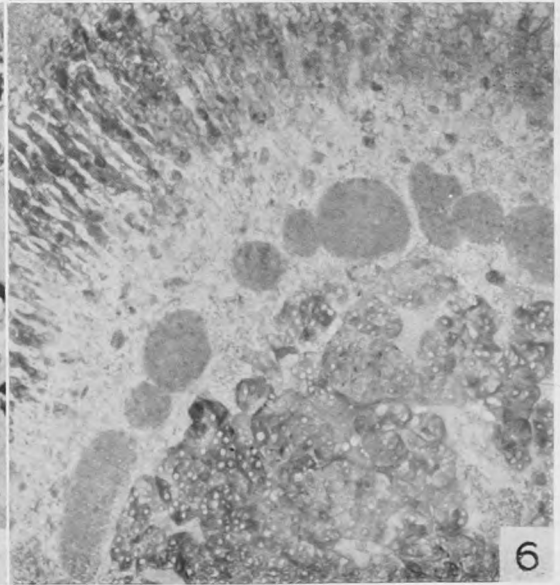
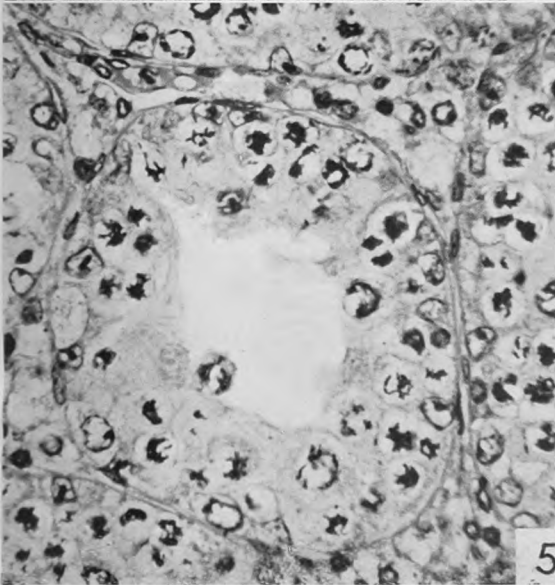
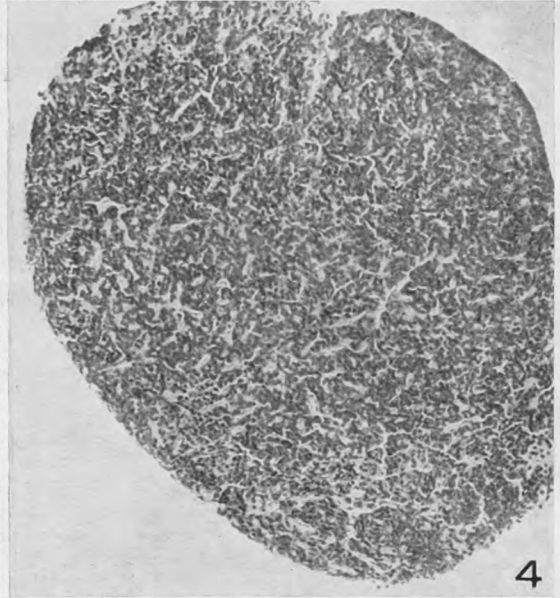
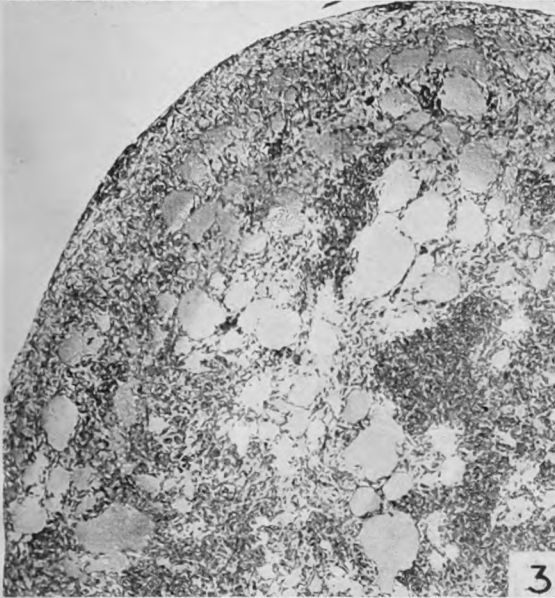
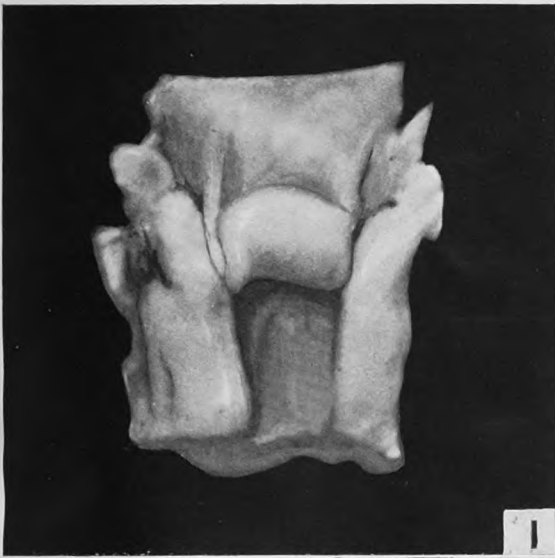
effects will be described in greater detail in subsequent publications.

The spleen was sometimes reduced to a thin red ribbon, and the thymus was atrophied. The changes in the testis have been mentioned above. These changes suggested a general effect of œstrin, and further search led us to a systematic examination of the pituitary. During this experiment we have so far examined the pituitary gland of 12 mice treated with œstrin over a prolonged period. Of these, only 1 gland was normal to the naked eye, 8 were macroscopically enlarged without an alteration in the general shape of the organ and without gross pathological lesions in the gland, and 3 were definite adenomatous tumours, nodular, round, deeply congested and hæmorrhagic, and from five to ten times the size of the normal gland, so that the tumour extended over the optic nerves and in one case (No. 217) compressed them, producing degenerative changes in the nerve (Fig. 2). Even with the naked eye it could be seen that the changes affected mainly, if not entirely, the anterior part of the gland. The experimental details concerning the three animals in which these tumours were found are given in the following Table:—

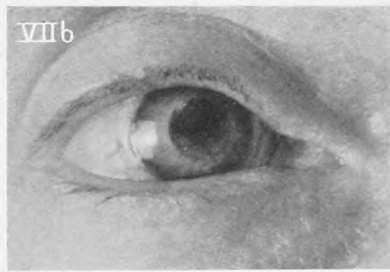
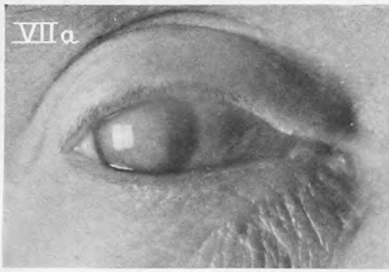
Ref. No.	Strain.	Sex.	Treat-ment with œstrin.	Prepara-tion.	Condition of mamma.
202	L.Z.	Male.	25 weeks.	a-folli-culin.	Mamma carcinoma.
215	Mixed.	Male, castrated.	44 "	"	Mamma well developed but no carcinoma.
217	D.Z.	"	19 "	Keto-hydroxy-œstrin.	Mamma carcinoma.

¹ Lacassagne, A. : Compt. rend. Soc. de Biol., 1932, cxv., 630.

² Burrows, H. : Amer. Jour. of Cancer, 1935, xxiv., 613.



DRS. CRAMER AND HORNING: EXPERIMENTAL PRODUCTION OF PITUITARY TUMOURS AND OF MAMMARY CANCER BY PAINTING THE SKIN WITH ŒSTRIN

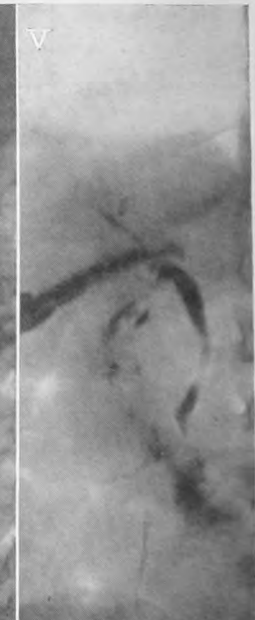


MR. RYCROFT : CORNEAL GRAFTS

MR. HOSFORD : KÜMMELL'S DISEASE



MR. MONTEITH : BEDSIDE RADIOGRAPHY FOR A FRACTURE



MR. COSBIE ROSS : LIPIODOL IN SURGERY OF BILIARY PASSAGES

The pituitary tumours were found, therefore, in mice of both strains and in mice with and without the presence of a mammary cancer.

The detailed histological examination of the pituitaries has not yet been completed, but a preliminary microscopic examination of the three adenomata has shown extensive hæmorrhages and congestion, confined almost entirely to the pars anterior and disorganising it (Fig. 3). There was also an excessive number of the chromophobe type of cell, so that the condition may be described as a hæmorrhagic chromophobe adenoma of the anterior part. This was associated with a general condition of the animals, which is generally taken to be hypopituitarism. In man also chromophobe adenomas are known to produce a state of hypopituitarism.³ The condition produced by us experimentally resembles in many respects the syndrome of a disease in man known as Simmonds' disease. This disease, which is found more frequently in women than in men and is said often to follow parturition,⁴ is associated with an extensive destruction of the anterior part of the pituitary.

According to the prevailing conception, the pituitary presides over the whole endocrine apparatus, and it is therefore probable that the changes observed by us in the other endocrine organs are secondary to the changes in the pituitary. But if the pituitary presides, its position is not that of a dictator but rather of a *primus inter pares*. For as our experiments show, it is itself susceptible to hormonal influences coming from another part of the endocrine apparatus. Since in these experiments the changes in the pituitary and the development of malignancy in the mammary gland are both produced by œstrin it is reasonable to suspect that the two may be ætiologically related. Further investigations are necessary to determine how the chain of events is linked together.

As this paper is a preliminary communication we have restricted ourselves to statements on new and outstanding changes which we believe to have established on a sufficiently large material, and we have refrained from mentioning observations which will have to be repeated and checked by further experiments. Since œstrin preparations are now being used extensively in gynæcological practice it may be

well to point out that the carcinogenic changes here described were produced by the administration of œstrin prolonged over a period representing a considerable fraction of the normal span of life of a mouse and corresponding in man to a period of from 7 to 10 years, while the therapeutic administration of œstrin preparations in man is, in skilled hands, limited to short periods of a few weeks or months. The development of mammary cancer described in this paper should not, therefore, be used as an argument against the therapeutic application of œstrin preparations. The discovery that the sphere of action of œstrin preparations extends beyond the generative organs and embraces the whole endocrine apparatus is likely to enhance greatly their therapeutic importance.

KÜMMELL'S DISEASE

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(WITH ILLUSTRATION ON PLATE)

In 1894 Kümmell gave an account of six cases of a condition of the spine which he said had not previously been described. Actually Verneuil had described it in 1892. Since that date Kümmell has published several more papers on the subject and other writers have reported many cases. The condition has come to be known as Kümmell's disease (Kümmellsche Krankheit).

Kümmell divided the course into three stages, but Cardis, Walker, and Olver have described five stages. Briefly they are:—

1. *History of an injury.*—This may be quite slight, or severe enough to keep the patient in bed. The injury is not usually directly to the spine but affects it indirectly by sudden forced flexion, as, for example, a doubling-up injury when a mine shaft collapses on a man, or a fall on to the buttocks from a height causes a sudden jar to the spine.

2. *Post-traumatic period.*—This also is very variable. There may be no symptoms. On the other hand, there may be local pain in the back and rarely even paraplegia is seen.

3. *Latent period.*—During this stage there are no symptoms. Any pain or paraplegia has disappeared

EXPLANATION OF PLATE

MR. RYCROFT

FIG. VII. (CASE 1).—Before operation (left) the right cornea is completely grey and opaque. The graft (right) is not bevelled and its appearance should be compared with that of the bevelled graft shown in Fig. VIII.

FIG. VIII. (CASE 3).—The condition of the only eye. The vacant staring appearance contrasts with that after operation shown on the right.

MR. MONTEITH

FIG. I.—Fracture: paratrochanteric and of shaft and lesser trochanter.

FIG. II.—Protraction, abduction, and flexion: detachment of lesser trochanter.

FIG. III.—Metal stay incorporated, maintaining abduction and flexion without protraction: reposition of lesser trochanter.

FIG. IV.—State of femur seven months after injury.

MR. HOSFORD

Compression fracture of ninth dorsal vertebra in case, clinically and radiographically resembling Kümmell's disease.

MR. COSBIE ROSS

FIG. I. (CASE 1).—The narrower tube is the one draining the common bile-duct. The radiogram shows the lipiodol, part of which is filling the duct, and the remaining part in the duodenum.

FIG. II. (CASE 2).—The common duct is outlined by a thin column of lipiodol, part of which has passed on into the duodenum. The two translucent smaller areas are due to air bubbles which entered with the lipiodol.

FIG. III. (CASE 3).—This reveals the second part of the duodenum clearly outlined by lipiodol, while the common duct is barely seen.

FIG. IV. (CASE 4).—In this case the whole biliary tract is outlined, there is dilatation of the common duct but free entrance to the duodenum.

FIG. V. (CASE 5).—This again reveals free passage of the lipiodol into the duodenum.

It is very variable in length and may be anything from a few days to months or even years.

4. *Onset of fresh symptoms.*—These are chiefly pain in the back and a sharp kyphosis at the site of the affected vertebral body which in a skiagram is seen to have collapsed.

5. The last stage depends on the institution of proper treatment or otherwise. If treatment is neglected there is complete collapse of the affected vertebra, whereas if satisfactory treatment is carried out any collapse of the bone is prevented and there is a resolution of the pathological change.

A number of theories have been advanced from time to time to account for this post-traumatic collapse of a vertebra. It will suffice to mention a few of these.

Kümmell originally believed it to be a "rarefying osteitis" of inflammatory origin following a disturbance of nutrition of the bone. Later he took the view that there was always some damage to the bone. In two further papers in 1928 he refers to Schmörl's work on prolapse of the nucleus pulposus of the intervertebral disc into the body of the vertebra, as having some bearing on Kümmell's disease.

Ieule believed that the changes in the bone were due to vasomotor disturbances brought on by trauma. Mikulicz held that trauma caused intra- and extradural hæmatomata which, by infiltrating nerve-roots and ganglia, brought on trophic changes which caused a softening of the bone. Ludloff found rupture of vessels of the lumbar segments and considered that the subsequent changes in the bone were due to nutritional impairment.

In the last few years post-traumatic atrophy has been widely discussed, and it has been suggested that Kümmell's disease is an example of it. Watson Jones and Roberts state, "If it be accepted that Kümmell's disease of the spine . . . can occur in the absence of any fracture, it is to the hyperæmic decalcification of contusion of the vertebrae that the condition must be ascribed." King goes further and seems to believe that Kümmell's disease can occur in the absence of any fracture and is of the nature of a post-traumatic hyperæmic rarefaction.

THE RADIOGRAPHIC DIAGNOSIS

It must be obvious that in order to establish a diagnosis of Kümmell's disease in the case of a patient with kyphosis there must be available one skiagram taken soon after the injury showing an apparently normal vertebra and another at a later date showing collapse of the vertebra. It is essential to have a lateral view of the vertebra, anterior and posterior views being of little value in detection of any abnormality in the body of a vertebra. Also the skiagram must be good enough not only to show the outline of the body but also to show, at least to some extent, the internal architecture of the bone.

Without such a skiagram it is quite impossible to say whether at the time of the original injury to the spine there was a fissured fracture of a vertebral body without displacement or whether no actual damage was done to the bone. The latter must be the case in order to establish the diagnosis of Kümmell's disease.

A search for a case of Kümmell's disease in which there is a satisfactory lateral skiagram immediately after the accident is not very fruitful. Kümmell's first papers were published before the days of X rays. In some of his later papers there are reproduced two skiagrams, one showing an antero-posterior view of a man's spine taken some time after the accident, and a later view showing some collapse of a vertebra.

The first antero-posterior view, however, although it is a good skiagram, is quite useless as negating any injury to the body. Of the comparatively few cases he quotes, this is the only one of which any skiagrams are produced.

In Schultz's extensive review of the condition with reports of 21 cases no skiagrams are reproduced.

Baker in the eight cases he quoted did not see any skiagrams taken immediately after the accident nor was he able to get reports on them.

Blaine described ten cases but none of them were radiographed in the early stages.

Cardis, Walker, and Olver, in 1928, quoted 14 cases in their excellent paper on Kümmell's disease, but in only one was any reference made to an early skiagram before collapse of a vertebra, and this was not reproduced.

In 1931 Rigler reported one case, that of a woman aged 55, who had a severe injury and was in bed for seven weeks with pain and weakness in the back. About a fortnight after getting up a skiagram showed no apparent abnormalities of the seventh or ninth dorsal vertebrae, but nine months later a second skiagram showed that they were compressed. This may have been a case of Kümmell's disease without any initial fracture, but during seven weeks in bed the vertebrae had time to begin to consolidate if there was a fracture, and two weeks out of bed is little time for compression to begin to show itself distinctly.

King reported six cases. One of these is an important case because there was the opportunity for an autopsy and a very detailed examination was carried out. It was the case of a woman of 57 who had a "severe fall," and later developed a kyphosis and paraplegia. It is most unfortunate that no skiagrams were obtained at the time of the fall. No early skiagrams are reproduced in any of his six cases.

From a careful examination of the literature I have been unable to find a case of Kümmell's disease in which a good lateral skiagram taken after the initial injury shows a normal vertebra. The following case may be quoted :—

In 1929 a labourer, aged 55, fell twenty feet off a ladder and was admitted to St. Bartholomew's Hospital. He had sustained a laceration of his scalp and a fractured clavicle, and complained of pain in the lower dorsal region. No deformity was present. Skiagrams were taken twice but showed no abnormality. He walked out of hospital three weeks later. After a further week a slight angular deformity was visible in the lower dorsal region and a skiagram showed a compression fracture of the ninth dorsal vertebra (Figure on Plate).

This is not quoted as a case of Kümmell's disease but as one of a fracture of the body of the vertebra which was missed at the first examination; it is, however, an exact parallel to many cases reported as Kümmell's disease in that (1) skiagrams taken immediately after the accident showed no deformity (but they were not really satisfactory views); (2) there was a latent period; and (3) compression and deformity were seen at a later date. One cannot but believe, however, that this is anything other than a case of compression fracture of a vertebra which was not recognised by the clinician or the radiologist; and there seems no reason to invoke any other pathology than that of fracture, nor to give it any other name.

DOES THE DISEASE EXIST ?

In 1928 Cardis, Walker, and Olver described Kümmell's disease as still struggling for recognition. There surely must be some doubt about the real existence of any condition which, over thirty years after its first description, is not fully recognised. There seems no real reason to believe that Kümmell's disease is anything other than a fracture of a

vertebral body. At the time of the original injury there are presumably one or usually more fissures through the bone. There may be little or no compression at the time: even if there is some compression it is likely to disappear when the patient lies flat in bed and so might not easily be recognised in a skiagram even if the latter were obtained. If at this stage the true state of affairs is recognised and a fracture of the body of a vertebra is diagnosed, appropriate treatment is carried out, the spine being immobilised in the fully extended position; no compression of bone is allowed to take place and the bone consolidates in its normal shape and position and the case is looked upon as a satisfactory result of a fracture of a vertebral body. On the other hand if the possibility of a fracture of a vertebra is overlooked for any reason and a kyphosis appears at a later date, no proper treatment having been carried out, it has been customary to refer to it as Kummell's disease, and to discuss a variety of pathological changes which may have brought it about.

If we look in other parts of the body for the same changes following a fracture which has been overlooked and not properly immobilised, we see similar absorption and loss of bone substance. Typical situations where these changes are seen when efficient fixation has not been employed are in fractures of the neck of the femur, and in the common fracture of the carpal scaphoid. In this connexion it is of particular interest to find that King, a strong advocate of the theory that Kummell's disease is due to a post-traumatic hyperæmic rarefaction, says: "The usual finding then even in the cases in which there is fracture, is an active hyperæmia."

It seems inconsistent and confusing therefore to make an exception of the vertebral bodies and give a special name to an overlooked fracture in this situation when no such deception is carried out in the case of other bones. Kummell must be given every credit for his observations and for drawing attention to the delayed collapse of a vertebra after an injury rather than for his explanation of this delayed collapse.

Thus it would seem to be advisable to teach not that there is a condition known as Kummell's disease of somewhat obscure pathology but that: (1) Compression fractures of the bodies of the vertebrae are easily overlooked owing to their relatively mild symptoms and absence of signs. (2) In all cases of pain in the spine following an injury skiagrams of the vertebrae should be taken and if the lateral view is not clear it should be repeated. (3) If the skiagrams show no fracture and the pain persists when the patient has got up, another lateral skiagram should be taken and the closest clinical observation kept for the onset of any kyphosis. (4) Treatment in an ambulatory plaster jacket should be instituted at the earliest sign of any injury to a vertebral body.

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THE USE OF
 LIPIODOL IN SURGERY OF THE
 BILIARY PASSAGES

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(WITH ILLUSTRATIONS ON PLATE)

WHILE the use of lipiodol in the post-operative management of cases involving the biliary ducts is by no means new, general application of the method is unusual. Gabriel¹ in 1930 described a case where a biliary fistula was demonstrated by X rays after the injection of lipiodol, and Ginsburg and Benjamin² reported a series of cases in the same year.

During the course of operations on the gall-bladder it is sometimes a surgical necessity to explore the common bile-duct when the latter is dilated and when the presence of stones is suspected. Often it is possible to suture the common bile-duct with safety after incision and exploration; in these cases a drainage-tube is desirable, secured to the suture line by a single stitch. Usually the suture line remains watertight, and no bile is discharged through the precautionary tube. There are occasions, however, when the local pathology of the ducts demands drainage by a catheter, especially where numerous stones have been removed from the ducts and where infection of the latter is present.

In my own series, consisting of 110 operations for cholecystitis, the common bile-duct was explored 27 times with 4 post-operative deaths. The proportion of cases with stones in the gall-bladder or ducts represented 80 per cent., whereas in a previous investigation of 153 cases, 87 per cent. had the combined pathology of inflammation and stones.³ Out of the 27 explorations of the common bile-duct, stones were found in the ducts and removed in 16 instances (see Table).

Operations on the biliary tract (over 80 per cent. had stones in addition to cholecystitis)	110
Cholecystectomy	82
Cholecystostomy	17
Exploration of biliary ducts—	Cases
(a) Through stump of cystic ducts	3
(b) Exploration and immediate suture	6
(c) Exploration and subsequent drainage by catheter	17
(d) Generalised inflammatory sclerosis of the ducts	1
Stones present in biliary ducts	16
Number of lipiodol injections carried out	14

INDICATIONS

In 3 of the 27 cases in which exploration of the ducts was necessary, it was carried out through the stump of the cystic duct. In another case a generalised inflammatory sclerosis of the ducts was found a year after cholecystectomy had been performed; in this case no drainage was instituted. In 6 cases the bile-duct was sutured after exploration, but in 17 a catheter was stitched into the duct for various reasons, usually where numerous stones had been removed or where infection was present.

In a few of the latter cases it was not certain at the time of the operation whether the ampulla of Vater was patent, owing to the necessity of concluding the operation rapidly in view of the poor condition

or advanced age of the patient. In an elderly patient with jaundice due to a stone in the common bile-duct the operation may be necessarily a hurried and inadequate one, and the time required for complete exploration of the ampulla not available without undue risk. To quote the late Mr. Frank Jeans, "better a live problem than a dead certainty." Moreover, even with available time to pass a bougie, or to pass a rubber catheter and subsequently to pump saline through it into the duodenum, it is possible to miss a small stone, especially where there is much thickening in the vicinity of the ampulla, and where chronic pancreatitis is a prominent complication. Kehr admitted missing stones in the biliary ducts in 2.5 per cent. of 1105 operations, and Deaver reported that second operations constituted 4 per cent. of 1189 explorations of the biliary passages.⁴ It is in the post-operative management of such cases as these that this method appears to be of value. Lipiodol is especially useful in what might well be called "second-hand" operations on the biliary tract. These cases are notoriously dangerous and difficult, and four examples are included among the present series. In connexion with these second-hand cases, the incision of choice appears to me to be a Kocher when a paramedian has been used on the previous occasion. A Kocher incision ensures that the operative field lies between the adhesions caused by the previous operation and the liver, and frequently the general peritoneal cavity is completely excluded, a useful feature when biliary drainage is contemplated.

Many tests have been used at various times for determining the patency of the common bile-duct. Among the better known tests are the following:—

1. The examination of the stools for bile-pigment.
2. The introduction of an Einhorn tube into the duodenum and the injection through the tube of magnesium sulphate solution. No bile is obtained through the tube when the common bile-duct is completely blocked.
3. The disappearance of jaundice.
4. The van den Bergh test.
5. If a T-tube has been introduced into the common bile-duct for drainage purposes, jaundice will occur when the outer extremity of the tube is clamped if there is not free entry of bile into the duodenum.

The most commonly used test is that mentioned first, but the following obvious fallacy suggests itself. If the faeces are normal in colour, bile is entering the duodenum without hitch; but where it is necessary to drain the common bile-duct for several days, all the bile may be discharged through the drainage-tube in spite of the fact that the ampulla of Vater is patent. Thus, this time-honoured test is not of great value where drainage of the common bile-duct is taking place. In fact, none of these tests are reliable criteria as there may be a partial suppression of bile giving light-coloured stools with a patent duct.

Finally, injection of lipiodol will not only indicate whether the block is partial or complete, but will demonstrate the site, and will exclude that due to spasm of the muscle of Oddi. If the lipiodol is held up in the common hepatic duct or supraduodenal part of the common duct, it is suggested that the usual cause is fibrous stricture, while ampullary blockage is commonly due to a stone if muscular spasm is excluded. Although the very definite advantages of the T-tube must be freely admitted, I have never succeeded in overcoming a prejudice due to the split in the common duct necessarily produced when finally withdrawing the tube, and due to the bulky T junction. This may or may not predispose to stricture formation, but I feel safer

with a soft rubber catheter which can be introduced through a small incision in the duct, can be removed without causing any further damage, and has in my experience provided excellent drainage. Further, although in previous papers the injection of lipiodol has been carried out through a T-tube, equally good results can be obtained through a soft catheter.

Although it is the usual custom in this country, and my own practice, to remove this catheter ten days to two weeks after the operation, Overholt⁵ is strongly of opinion that it should not be removed before the patency of the biliary tract has been demonstrated by lipiodol. His statement that a tube in situ is easier to deal with than a biliary fistula appears at first sight to require some consideration; but a recent case has convinced me that a tube is certainly safer than a fistula. In this case drainage of the common duct had been carried out by another surgeon 14 days previously. On the 10th day the tube was removed, and on the 11th the fistula superficially closed, and pain and discomfort were experienced in the right upper quadrant of the abdomen. On the 14th day general "bile" peritonitis suddenly supervened, and at operation large quantities of bile were evacuated from the peritoneal cavity. What had happened was that bile had collected in the region of Morison's pouch, owing to ampullary block and to premature closing of the biliary fistula.

A further argument in support of Overholt's view is furnished by Pribram's method (described below) for the solution of ampullary stones by ether.

TECHNIQUE OF INJECTION

About ten days after the operation, 10–20 c.cm. of warmed lipiodol are slowly injected into the tube draining the common bile-duct. Before doing so, any bile in the tube is aspirated, and care is taken to use no force in injecting the opaque liquid. Immediate radiography will show the lipiodol in the duodenum if the duct is patent; it is remarkable with what rapidity the lipiodol passes into the duodenum, and it is almost impossible to outline the ducts in such a case. For this reason lipiodol cannot be relied upon to demonstrate a residual stone which is not causing obstruction. The non-opaque stone may be outlined by adsorbed lipiodol, but the latter passes on so quickly into the duodenum that no indication may be given.

The radiogram, however, may reveal the lipiodol filling the common bile and common hepatic ducts and stopping short at the ampulla. This hold-up may be due to spasm of the ampullary sphincter or to an impacted stone. In the former case, a second radiogram taken three-quarters of an hour after the hypodermic administration of atropine may reveal that the lipiodol has passed into the duodenum. If the opaque fluid has entered the duodenum either before or after the administration of atropine, the tube draining the common bile-duct may be withdrawn with safety on the tenth day after the operation with the confident expectation that recovery will take place without either the supervention of jaundice or of persistent biliary fistula. If, on the other hand, the lipiodol is persistently held up at the ampulla, a stone in that situation is very probable.

VARIOUS CONSIDERATIONS

The sphincter of Oddi.—There is considerable divergence of opinion as to the effectiveness of this sphincter. Pribram⁶ states with conviction that sphincteric spasm occurs frequently and may produce characteristic symptoms. This view is supported by Kretchner,⁷ who reproduces an interesting radio-

gram in which the lipiodol is shown filling the common bile and hepatic ducts and also outlining the lower end of the duct of Wirsung. This observation seems to throw some light on the pathology of acute hæmorrhagic pancreatitis. On the other hand, as previously mentioned, all observers have commented on the rapidity with which the opaque fluid enters the duodenum in the great majority of cases.

Biliary dyssynergia or spastic dyskinesia.—While this condition of abnormal tonus of the ampullary sphincter may be deduced by the use of the duodenal tube, it can only be positively demonstrated by injection of lipiodol. There is steadily increasing clinical and physiological evidence not only of the effectiveness of the sphincter but also of the occasional presence of biliary dyssynergia.

Reference may be made especially to the recent work of Russell Best and Frederick Hicken.⁸ These authors compare lesions of the ampullary sphincter with cardiospasm, pylorospasm, &c., and bring forward much radiological evidence that biliary dyssynergia may produce a definite mechanical block to the passage of bile into the duodenum. It is further claimed that the subsequent dilatation of the biliary ducts may produce attacks of biliary colic, and that the condition may be independent of cholangitis, the presence of stones, strictures, duodenitis, or pancreatitis. This view offers a reasonable explanation of the occurrence of biliary colic and of the so-called "hepatic neuralgia," and accounts for the persistence of gall-bladder symptoms in some few individuals after removal of the gall-bladder. These post-operative symptoms have usually been attributed in the past to congestion or infection of the ducts, or to the elusive "missed stone." When a definite diagnosis of biliary dyssynergia has been made by injection of lipiodol, the post-operative régime should include substances which relax the choledochal sphincter such as atropine, magnesium sulphate, or fats. It is interesting to contemplate the possibility of biliary dyssynergia, occurring as a primary condition, causing stagnation of bile and predisposing to the precipitation of stones.

Additional applications.—The method, may also be applied where cholecystostomy has been performed, the opaque fluid filling the gall-bladder and the ducts provided the cystic duct is patent. Similarly, where the gall-bladder has been drained in a case of acute pancreatitis it is helpful as well as instructive to demonstrate or exclude sphincteric spasm.

Possible dangers of the method.—Tenney and Patter-son⁹ have recorded a case where pyrexia, jaundice, and abdominal pain were produced by the injection of bismuth paste under pressure into a biliary fistula. The explanation here seems to be the simple one of a thick paste blocking both fistulous tract and common bile-duct, especially as the symptoms subsided subsequently. It is obvious that bismuth paste is highly unsuitable for this diagnostic measure.

Mallet-Guy, Beaupère, and Armanet,¹⁰ who record the onset of similar symptoms some hours after injection of lipiodol, are inclined to blame the viscosity of lipiodol blocking the common bile-duct and pancreatic ducts, and the production of "pancreatic œdema." In the latter case, however, there were several anomalous features. For instance, the jaundice was of painless onset following a course of neosalvarsan, and no stone or obstruction of the ducts was found at operation. Moreover, two further injections of lipiodol were given after the original 20 c.cm. in an attempt to outline the biliary tract.

In my opinion it is a great mistake to aim at outlining the ducts. If there is no obstruction the opaque solution passes into the duodenum with great rapidity, and little more than a minute residue is to be seen in the ducts. For this reason it is difficult to demonstrate with certainty a stone not producing a complete block. Occasionally, such a non-opaque stone is shown in the radiogram as a clear area outlined by lipiodol. Again, it is difficult to assess the value of outlining the biliary tract in cases of obstruction. It is sufficient for practical purposes to test the patency or otherwise of the biliary system, and this appears to be a safe procedure. I have carried out the diagnostic injection of lipiodol in 14 cases without the production of symptoms or other effects in any instance.

Ether solution of stones impacted at the ampulla.—When a stone has been demonstrated at the ampulla by lipiodol, Pribram advises the daily injection of a few cubic centimetres of ether into the tube draining the common duct for several days. He has shown that ether disintegrates certain gall-stones by dissolving the cholesterol nuclei, thus reducing the stones to a pultaceous mass. The latter passes readily through the ampulla into the duodenum. The application of this method to the treatment of biliary fistulæ is obvious. A fine rubber tube is introduced through the fistula down to the obstruction, and the subsequent daily injections of ether may obviate a difficult and dangerous operation in cases where the obstructing agent is a stone.

I have not had an opportunity of using ether as a solvent of gall-stones, for in the cases recorded below the lipiodol passed into the duodenum either before or after the administration of atropine; but from Pribram's recorded cases this method seems to deserve extended trial.

CASE REPORTS

CASE 1.—This was a woman, aged 67, who had had an operation for cholecystectomy performed some years previously. Operation was necessitated by repeated attacks of severe biliary colic associated with jaundice. The jaundice varied in intensity but never completely cleared. Her general condition was poor, and there was some jaundice at the time of operation. In view of the two latter facts, and of her age, the operation was necessarily a hurried one performed under gas-oxygen anaesthesia. Many adhesions had to be separated before the common bile-duct could be exposed and incised. Several faceted stones were removed from the common bile-duct, but her condition did not permit of more than a hasty palpation of the ampulla of Vater. A catheter was inserted into the common bile-duct and drained bile for nine days after the operation. Lipiodol (10 c.cm.) passed easily through the common bile-duct into the duodenum (Fig. 1. on Plate), so the tube was removed on the ninth day. She was discharged from hospital three weeks after the operation and has not had either jaundice or biliary colic from that date.

CASE 2.—This was a male, aged 20, who was admitted to hospital with severe biliary colic which settled down, but was succeeded by jaundice. At the operation a strawberry gall-bladder with thick pink walls was removed and the common bile-duct exposed. When the common bile-duct was opened a collection of "bile mud" was evacuated. The subsequent bile was normal in appearance and consistency. The ducts appeared to be sub-acute inflammation, and a row of elastic glands were found in the right edge of the gastrohepatic omentum immediately behind the common bile-duct. These glands appeared to be secondary to the strawberry gall-bladder, and subsequent microscopic examination confirmed that their origin was inflammatory. Several of the larger glands were excised in order to avoid extrinsic pressure on the duct. It was found possible to pass a 7/10 bougie through the common bile-duct into the duodenum with

ease. A catheter was inserted into the common bile-duct and the operation concluded. A few days later radiography revealed the lipiodol in the duodenum (Fig. II). This patient was discharged from hospital three weeks after operation, his jaundice having completely cleared and his wound healed.

CASE 3.—This was a female, aged 48, who had had two previous operations elsewhere, one of which consisted of cholecystectomy, incision of the common bile-duct, and removal of stones from the hepatic and common bile-ducts. A subsequent operation was performed for incisional hernia. She was admitted to hospital suffering from severe biliary colic, and a history of two recent mild attacks of jaundice. The abdomen was opened through a Kocher's incision, and the common hepatic duct exposed after a prolonged and arduous separation of adhesions. The common bile-duct and the duodenum were welded together by dense inflammatory adhesions that defied separation. The common hepatic duct was opened and several stones removed from it and the common bile-duct. A probe passed into the duodenum, but the probe could not be identified in the dense inflammatory mass just above the first part of the duodenum. A drainage-tube was inserted into the common hepatic duct and the operation concluded. Although it was possible to pass the probe into the duodenum, it was not possible to exclude completely stone or stones at the lower end of the common bile-duct, so that it was very satisfactory, a few days later, to obtain a clear radiographic picture of the common bile-duct and to see that the lipiodol had passed without hitch into the duodenum (Fig. III). The patient subsequently had an uninterrupted convalescence.

CASE 4.—This was a female, aged 62, who had had two previous operations—one for cholecystectomy and another for a perforated gastric ulcer. Her general condition was poor and there was definite evidence of myocardial degeneration. Operation was necessitated by repeated attacks of severe pain. The abdomen was opened through a Kocher incision and the common bile-duct exposed. The adhesions were especially dense as the previous perforated gastric ulcer added its contribution of adhesions to those due to the cholecystectomy. The common bile-duct was opened, stones removed, and a catheter inserted into the duct which was approximately one inch in diameter. A 9/12 bougie passed easily into the duodenum; the operation was concluded. After the operation her condition was never satisfactory, but the patency of the common bile-duct and ampulla of Vater were demonstrated by the rapid passage of lipiodol into the duodenum (Fig. IV.). Unfortunately, however, her condition became steadily worse, and death occurred one month after the operation. A post-mortem was not obtainable, but all clinical evidence went to suggest the cause of death to be myocardial failure rather than any biliary upset. There was no suppression of bile at any stage of her illness.

CASE 5.—This woman, aged 48, came into hospital with a history of three attacks of severe abdominal pain and vomiting, said to have been associated with the doubtful appearance of jaundice on one occasion. One of these attacks had occurred a few days before her admission to hospital. When examined there was protective spasm and tenderness over the whole of the upper abdomen, especially over the gall-bladder. Radiography of the latter revealed two opaque gall-stones in the gall-bladder, which did not fill or excrete dye. The gall-bladder was exposed by a Kocher's incision, and chronic cholecystitis and cholelithiasis were found, in conjunction with subacute pancreatitis. The pancreas was swollen, oedematous, and inflamed, and there were small areas of recent fat necrosis. Obviously, the attack from which she had suffered several days before admission to hospital had been that of an acute or subacute pancreatitis. The gall-bladder was opened, the stones removed, and a cholecystostomy performed. It was decided not to drain the pancreas as there did not appear to be any indication to do so, especially as the condition was obviously subsiding.

This patient's convalescence was smooth, and a radiogram of a subsequent injection of lipiodol through the tube draining the gall-bladder revealed the opaque fluid in the duodenum (Fig. V.).

SUMMARY AND CONCLUSIONS

1. Operations on the biliary passages often present difficulties, especially where the post-operative management is complicated by doubts as to the patency of the ducts. 2. The usual clinical tests for determining the patency of the ducts, especially the presence of bile-pigment in the faeces, are often fallacious. 3. The injection of lipiodol into the common bile-duct presents no difficulty, is not dangerous in itself, and yields valuable information. 4. The lipiodol method determines the prognosis with accuracy. Further, it indicates the advisability or otherwise of removal of the tube draining the common bile-duct, and the possible application of additional measures. 5. The condition of biliary dyssynergia affords a reasonable explanation for post-operative symptoms in patients where cholecystectomy has been carried out. The diagnosis of this condition can only be made positively by means of the lipiodol injection, and when such a diagnosis has been made, post-operative treatment should be directed towards promoting relaxation of the ampullary sphincter. 6. Some typical examples are described in which the lipiodol method has proved of value.

I am indebted to Dr. P. H. Whitaker whose welcome help has been of the greatest assistance to me from the radiological aspect.

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Clinical and Laboratory Notes

BEDSIDE RADIOGRAPHY FOR A FRACTURE

BY W. B. R. MONTEITH, M.A. Camb., F.R.C.S. Edin.

(WITH ILLUSTRATIONS ON PLATE)

AN agricultural labourer of 75 presented himself at my house recently suffering from a cold in the head incapacitating him from work. This was two years after he had fractured his femur and a few days after I had been reading about the need for fracture clinics in this country. It seems to me in retrospect that this man's sound functional recovery and ability to do full work illustrates first the value of detail in treatment, and secondly the value of radiography in bed without disturbance. These should be available whether the patient is treated at home, in hospital, or in a fracture clinic.

At the age of 73 this man fell heavily from a haycart. Shortly after admission to the Butterfield Hospital, Bourne, X ray examination (Fig. I. on Plate) showed a comminuted fracture of the left femur, involving shaft, neck, and both trochanters. By means of strapping along the length of thigh and leg traction was applied, with the leg rested in a Thomas splint and abducted and flexed at the hip-joint. A subsequent radiogram, taken without moving the patient, showed satisfactory abduction, protraction, and alignment, but with small trochanter displacement, due undoubtedly to pull by the psoas (Fig. II.). It then seemed best that the abduction and flexion should be maintained without further protraction.

A rigid iron frame was made to extend from lower ribs to calf, having riveted to it at right angles a half hoop to embrace thorax and cross strips at mid-thigh and calf; and having the longitudinal strip bent, at the level of the hip-joint, outwards through 30° to maintain abduction and upward through 40° to maintain flexion. This was incorporated in a plaster-of-Paris case extending from the lower ribs and enclosing the foot on the left side, and to the knee on the right. X ray examination then showed satisfactory disposition of the fragments (Fig. III.). After two months the left knee was liberated, the metal support having been sawn through at that level, and the plaster case removed from knee downwards. After three months weight bearing was permitted while still wearing the plaster case. Four months after the accident the patient was discharged from hospital wearing a walking calliper. This he discarded (contrary to instructions) after a few weeks, for he complained that it interfered with digging! Fig. IV. shows the state of affairs seven months after the injury.

It is now two years since the accident, and for more than twelve months he has been doing full work including potato digging. There is a good range of movement at the hip, though some limitation of abduction, and no measurable shortening. The man himself admits no disability.

The successful result emphasises once more the fact that stereotyped methods of treatment are inadvisable. On the positive side it points to the extreme value of intercurrent radiography, without disturbance of limb or patient, as a means of making the treatment suit the patient.

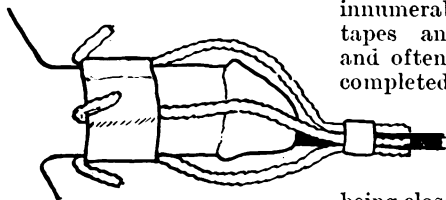
Bourne, Lincs.

A METHOD OF TYING IN A CATHETER

By G. B. DAVIS, M.R.C.S. Eng.

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MANY methods have been devised for keeping a catheter securely in place, ranging from simple but primitive devices to elaborate "machines." Probably the method most commonly used now, in hospital and private practice, is the system of tapes tied to the catheter, the four ends being held to the penis by an encircling band of strapping. Even this has disadvantages. (1) It takes time to put on neatly. One is apt to get "tied up" with the seemingly innumerable ends of tapes and strapping, and often when it is completed all the tapes



are not equally taut. (2) The tapes, being close to the penis, become very dirty from urine and pus tracking round the catheter. (3) With the slight and unavoidable tension on the catheter, the tapes become taut, and cut into the penis as they converge on the catheter. This occurs especially as they cross the corona, and I have often seen ulcers where tapes, hardened by dried urine and pus, have cut into the glans. This is, perhaps, the greatest objection to the method. (4) If the catheter has to be changed, or removed temporarily (e.g., for cystoscopy), the whole apparatus must be removed and a fresh one applied.

These objections may appear trivial but in practice are very real. The appearance of things after a catheter has been kept tied in for a week in a patient with infected urine or urethritis is enough to make one most dissatisfied with the tape method.

The following method aims at meeting these dis-

advantages, and, if not entirely overcoming them, at least mitigating them. Its essential feature is the use of something more rigid than tapes. A material which was soft, stiff, and at the same time pliable seemed indicated, and for this purpose pipe-cleaners have proved the ideal thing. They cost 1d. per packet of 12, and four are necessary for each case, the "extra thick" variety being the best.

After the catheter has been passed, four pipe-cleaners are strapped with 1 inch Elastoplast strapping round the circumference of the penis, as near the base as possible. The four ends are then brought to the catheter and fixed there with a small strip of elastoplast, in such a way that each pipe-cleaner has a definite bow, and stands well away from the glans penis. The ends at the base of the penis are then bent back or cut off. It is important to apply the band of strapping loosely round the penis to avoid constriction and œdema, and to press it well on to the skin. The whole procedure takes under a minute, with practice, and has proved quite satisfactory.

Unlike the tapes, pipe-cleaners have the necessary rigidity to "stand away" from the penis and not press on the corona. Because they can be made to stand away, too, they are not soiled so soon by urine or pus. Being soft, they do not cut into the skin, and are quite comfortable to the patient. If the catheter has to be removed temporarily, the strapping holding the ends on the catheter is removed, leaving the pipe-cleaners in place, ready to be strapped again to the new catheter. The method is essentially simple, clean, and very easy to apply. By his kind permission, it has been used on the last 30 cases under the care of Mr. John Everidge.

AN UNUSUAL CAUSE OF INTERNAL HÆMORRHAGE

By EMLYN E. LEWIS, F.R.C.S. Eng.

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EARLY in August, 1935, a man 77 years of age was admitted to the Queen's Hospital having collapsed in the street. He was suspected of having a perforated ulcer. He had been unwell for a few days, having shortness of breath. There was no indigestion. The collapse was ushered in by giddiness and by slight upper abdominal pain which by the time of examination had become severe and generalised. His pulse was rapid and thready, his temperature subnormal, and his skin cold and clammy. He was tender and rigid over the whole abdomen but particularly in the epigastrium; there was no diminution of liver dullness, and he had much pain in the right shoulder.

A diagnosis of mesenteric thrombosis was made, morphia gr. $\frac{1}{4}$ was given, and rectal saline administered. The patient's condition improved and in two hours the abdomen was opened under gas-and-oxygen anaesthesia. The peritoneal cavity contained a great quantity of blood. The spleen was intact, and the stomach was delivered with abnormal ease owing to the lesser omentum having been torn away from the lesser curvature. The torn omentum was widely infiltrated with blood-clot and expanded to a thickness of about 2 inches. No actual bleeding-point could be seen, and there was no evidence of fresh hæmorrhage. The man's condition being grave,

(Continued at foot of next page)

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF EPIDEMIOLOGY

AT a meeting of this section on Jan. 24th, with Surgeon-Captain S. F. DUDLEY, the president, in the chair, a discussion took place on the

Use and Abuse of the Swab in Combating Diphtheria

Dr. H. J. PARISH, of the Wellcome Research Laboratories, Beckenham, began by saying that if immunisation were universal and timely the subject would be unimportant, but that there was still much diversity of opinion and practice. The responsibility for the diagnosis of diphtheria rested entirely with the clinician. In typical cases the swab should have only a confirmatory value, but where, clinically, the presumption was against diphtheria, it might help him to decide. Good technique was essential at the bedside as well as in the laboratory, and swab-taking should not be delegated to a student or nurse. An antiseptic gargle should not have been used for some time before using the swab, and with only a small nidus of infection care must be taken to rub the actual lesion and to avoid contamination with saliva. In a difficult case the bacteriologist should be given adequate data, and he, in turn, should issue his report without delay. He felt that antitoxin should be given whenever a swab was taken, as many lives were still being lost through failure to give serum early enough. The swab should be of greater value to the clinician and the medical officer of health as an administrative measure rather than as a diagnostic aid. Doubtful cases should not be notified until there had been a report on the swab. If negative, another swab should be taken, and if this was also negative the patient could safely be nursed at home, even in the presence of Schick-positive children: Vincent's angina or streptococcal sore-throat might, however, require hospital care. Caiger and O'Brien had reported that in 41 per cent. of 529 patients admitted as cases of diphtheria, and Dr. E. H. R. Harries that in 33.6 per cent. of 2099, a revision of the diagnosis was necessary. An "observation certificate" for admission to hospital would save much expense and a rebuff to the practitioner when his diagnosis was revised, but for this the L.C.C. system of isolation cubicles would be essential. Sometimes the membrane of a transient true diphtheria in almost immune persons might clear before admission to hospital and these might soon be discharged. It was often necessary to swab contacts in order to acquire early information about the spread of infection, and it was important to swab the nose as well as the throat, for there might be a positive result in one when the other was negative.

(Continued from previous page)

after evacuation of the blood, the abdomen was hurriedly closed. It was suspected that the left gastric artery had ruptured, possibly through an aneurysm. Three days later the patient died, and post-mortem examination showed syphilitic aortitis, aneurysmal dilatation at the origin of the coeliac artery, and rupture into the lesser omentum of an aneurysm about an inch in length situated on the left gastric artery. Evarts Graham in his "General Surgery" (Chicago, 1931) records almost a similar case treated successfully by Green-Powers.

In many outbreaks the real menace was the profuse carrier, but though those with few bacilli probably helped greatly in natural mass immunisation, the sparse carrier of one day might be a profuse and dangerous one on the next. The introduction of tellurite media had materially increased the proportion of positive reports and this increased the clinician's responsibility in interpreting them. It was of supreme importance to make virulence tests in convalescents and carriers, for they often harboured non-virulent forms.

In research the swab was invaluable in discovering the presence of diphtheria in Schick-negative reactors, the invasiveness of *Corynebacterium diphtheriae gravis*, the carrier rate and the effect upon it of artificial immunisation, and the origin of natural antitoxin. Certain strains of the gravis type seemed to be more invasive than the strains met with a few years ago, and were responsible for most of the diphtheria in Schick-negative reactors. The degree of protection shown by a negative Schick test might occasionally be inadequate to prevent infection by virulent strains, and it should be the aim of the practitioner to confer as high a degree of protection as possible. With the increasing prevalence of the gravis organism in various parts of England not only had there been an increase in the number of cases reported in Schick-negative reactors, but sometimes also in the number of carriers associated with those cases. A high carrier rate in an immunised population might be due either to the immunisation itself or to a more virulent and invasive strain, but there was no doubt that mass immunisation very greatly reduced the incidence of diphtheria.

The clinician must realise that the newer knowledge had complicated the work of the bacteriologist and this might explain some of the negative reports in undoubted clinical diphtheria. Some modification of laboratory technique was therefore desirable, and Dr. Parish suggested as a method, first, the examination of the direct smear, chiefly to exclude Vincent's angina, and then inoculation of a Löffler slope and of McLeod's chocolate tellurite medium, on a plate or, more conveniently, in a McCartney's screw-capped bottle. This enabled a report to be made in from 24-48 hours, but was difficult to carry out in a small laboratory. It tended, however, to shorten the bacillus and make microscopical recognition difficult. A simpler alternative was to give a preliminary report in 18 hours from a Löffler slope and, later, a full report after a thick subculture of the easily made Horgon and Marshall's blood tellurite medium and after fermentation and virulent tests. The great advantage of the tellurite medium over Löffler's was that it produced an increase of 10-25 per cent. in the positive results. It also differentiated the Klebs bacillus from Hofmann's and the gravis type from the others, and by inhibiting the growth of other organisms it allowed the colonies to be picked out.

The swab saved precious time in making a diagnosis and though improvements in technique had added to the cost the full laboratory examination was not necessary in the ordinary typical case. He had himself found the serum-treated swab most valuable for accelerating the report. He had described it in a letter to THE LANCET,¹ and had shown that an accurate report could be made in two hours in 80 per cent. of clinical diphtheria and in four hours in

¹ THE LANCET, 1935, i., 400.

95 per cent., contrasting with 83 per cent. after the 18 hours necessary by Löffler's method. The value of the swab was highest in administration and research as it was desirable to have the largest possible number of isolations. It was often very difficult with persistent carriers to decide if they were to be released from strict isolation before they became bacteriologically negative. This step should only be taken after a thorough overhaul of the upper respiratory passages by a competent specialist. Swabbing must not be used as a primary or even chief means of diagnosis, for diphtheria was a disease, not a mere bacteriological finding. It was also necessary to differentiate clinical diphtheria from the mere presence of the bacilli in the throat. Finally, he urged that every hospital should have its own bacteriological laboratory and that there should be closer coöperation between clinician and bacteriologist, but the onus in regard to early diagnosis and treatment rested with the physician.

Dr. C. O. STALLYBRASS (Liverpool), from the point of view of public health and hospital administration, discussed the value of the swab for diagnosing diphtheria before admission, in the isolation hospital, and in carriers and "missed" cases. He assumed that the swab was supplementary to artificial immunisation. Of 200 consecutive cases admitted to Liverpool hospitals as diphtheria, the diagnosis was confirmed in 175: the average age was 10 years; the average delay in calling medical aid was 36 hours, with a further 16 hours before the first dose of antitoxin was given; the mortality was 8 per cent. Swabs were much more often taken from adults than from children, and the delay in sending for the doctor was much greater in fatal cases. The condition of the patient, judged by the dose of serum on admission, was much graver in the fatal cases and in those who had not been swabbed outside, whose mortality was little more than half the average of the series (4.8 as against 8). The main causes of death were a severe type of infection and failure to realise the gravity of the infection in young children (by doctors as well as by parents). He urged the use of the swab in all doubtful cases, especially in children under 7 years of age. He advocated the more frequent swabbing of the nose. If a positive swab taken outside the hospital was not necessarily proof of diphtheria, still less did a negative swab show its absence. Swabs negative to diphtheria often showed Vincent's angina and swabbing was invaluable in the differential diagnosis.

In hospital the use of the swab had been radically changed by the division into "gravis," "intermediate," and "mitis" types. In Liverpool a case notified as diphtheria was seen on admission by a resident medical officer. Clinical diphtheria was sent to a general ward, doubtful cases to a bed-isolation ward or cubicle. A swab was at once taken and a Schick test carried out, followed, if necessary, by a dose of serum after four to six hours. The cultures if positive were tested for virulence, and if negative a second culture was made a few days later. Of 145 gravis only 1 and of 116 intermediate strains only 4 were non-virulent, but of 121 mitis strains 43 were non-virulent. The proportion of the gravis type in various cities was found from the literature to vary greatly.

With an outbreak of diphtheria in a children's ward, a kind of standstill order should at once be put into operation. The children could be separated into four groups: (a) Schick-positive, swab-positive; these should be isolated and receive a dose of serum.

(b) Schick-negative, swab-positive; carriers who should be isolated until a virulence test was done. (c) Schick-positive, swab-negative; these should be left in the ward and immunised. (d) Schick-negative and swab-negative; these remained in the ward and needed no further treatment. After this the standstill order could be relaxed.

The abuse of the swab lay mainly in allowing the bacteriological finding to warp the judgment, causing clinical diphtheria to be called something else, or a mere carrier an active case. This, however, still left open the question of what constituted clinical diphtheria.

Dr. J. D. ROLLESTON agreed with both the previous speakers that there was a need for collaboration between physician and bacteriologist, and that the onus in diagnosis rested primarily on the physician. There was still too often delay in giving antitoxin or in sending patients to a fever hospital, because a swab had not been received or was negative. Malignant diphtheria might simulate quinsy or mumps, and a swab might be negative because the bacilli were too deep in the mucous membrane, and it only became positive when the membrane began to separate. The danger of a wrong diagnosis was shown when 58 per cent. died of 40 patients with malignant diphtheria which had been incised, compared with 3.4 per cent. of other cases of equal severity. The direct smear helped to diagnose Vincent's angina and to show the prevalence of other organisms, but it should be limited to acute faucial diphtheria. A negative swab might be due to the struggling of the child, to applying it too soon after meals, to a recent use of antiseptic, or to the inexperience of the examiner. In the skin, diphtheria might simulate eczema, herpes, different forms of suppuration, and in wounds, in a number of which diphtheritic paralysis resulted. Obstinate whitlows would disappear after a small dose of diphtheria antitoxin. He was sceptical of the practical value of terminal swabbing before the patient was discharged from hospital; a negative swab was no guarantee that the patient was free from infection, and the return rate was no higher in hospitals which had given up this practice. It had, however, a certain forensic value.

The CHAIRMAN referred to a psychological abuse of the swab. If there were no such measure as swabbing, the practitioner would probably treat all his cases of diphtheria with antitoxin at once. He had found a 25 per cent. increase in the number of positive swabs by examining at 48 hours as well as at 24 hours, and he thought terminal swabbing would be much more valuable if the criterion of freedom were seven consecutive negative swabs in a week. He pleaded for more simultaneous Schick and swab tests, and more information was needed about isolation of carriers.

Dr. G. BOUSFIELD said that in poor districts the practitioner much opposed giving antitoxin to a patient unless he could prove to the relatives that it was necessary. If a case looked like diphtheria it should be treated as such by the doctor, or he should send the patient to an appropriate place. After having done 15,000 primary Schick tests, he had noticed that they were becoming less strongly positive. Care was needed before treating all the less profuse carriers, as that might upset Nature's balance and interfere with the process of natural immunisation.

Dr. E. A. UNDERWOOD objected to the text-book statement that antitoxin should be given whenever a swab was taken. It was also a questionable policy

to have doubtful cases removed to a fever hospital for observation.

Dr. E. W. GOODALL did not think it necessary to indulge in universal swabbing, and remarked that advocates of this did not include the staffs of fever hospitals. He had not met cases in which diphtheritic whitlows had caused other cases of diphtheria.

Dr. R. A. O'BRIEN thought every effort should be made to shorten the period in making a report on the swab.

Dr. CLARK TROTTER said it was difficult to get the practitioner to understand what he ought to do in cases of diphtheria. On the appearance of one case in a household the family doctor might swab all the other members and all who had been in immediate contact, just because he felt he was expected to do it. To eliminate mixed infections, Dr. Trotter said he was in the habit of giving every case of scarlet fever a prophylactic dose of diphtheria antitoxin; this greatly improved the scarlet fever cases and prevented any possible spread of diphtheria.

SECTION OF DISEASE IN CHILDREN

At a meeting of this section held on Jan. 24th, with Sir LANCELOT BARRINGTON-WARD, the president, in the chair, a paper on

Metabolism, General Nutrition, and Growth in Infancy and Childhood

was read by Dr. E. P. POULTON. He said that the work he had done with Mr. T. W. Adams possibly provided a new way of studying these problems, and he was bringing it before the section in the hope of getting assistance. He had had occasion to recalculate the metabolism results of Benedict and Carpenter from oxygen-consumption and respiratory quotient, and had found that in children these results differed from those obtained by calorimetry. Assumptions from the respiratory quotient were misleading, and he felt that carbon dioxide output should be regarded more truly as a measure of metabolism. By plotting the logarithm of the carbon dioxide against the logarithm of body-weight he found a linear increase up to 18 months, a flattening from 18 months to 4 years, and then a linear increase again. That is, as the child passed from 18 months to 4 years, the carbon dioxide output remained constant while the body-weight increased. A possible explanation was that when the child started walking more actively he lost fat, and metabolism continued thereafter at a slower rate. If this were so, there should be an alteration in the relationship of height to weight at this period, the gain in height increasing as compared with the gain in weight. Dr. Poulton demonstrated further graphs in which the logarithm of height and the logarithm of weight of children from birth to adult age were considered. There were inflexions in the curve when the body-weight reached 10 kg. (22 lb.) between the ages 10 months and 2 years, and again when the body-weight was about 18 kg. (39.5 lb.) at age 4-5 years. A third inflexion occurred at 15 years when body-weight was from 50 to 55 kg. (110 to 120 lb.). The slowing of the weight increase between 1 and 4 years without a proportional slowing in height increase could be explained by loss of fat, and the fact that metabolism remained about constant at this period, despite increase in weight, was regarded as due to the disappearance of *luxus* consumption associated with the fat of babyhood.

The relation of height to weight represented

general nutrition, and could be used with advantage to compare the general nutrition in different types of children and in different strata of society. An important question was whether nutrition was constant in different social strata. Baldwin had collected measurements in the United States which incidentally showed the change in relationship of height to weight at 5-6 years and again at 15½ years. The old figures of Roberts on public-school children and those of artisans showed what was generally agreed, that height and weight bore the same relationship to each other in all classes, so that this relationship could be roughly called an index of growth. There must, however, be a third factor, time, entering into it. It was usual to correlate time or age with weight, but when age and height are correlated there was a much closer agreement with the growth curves. Dr. Poulton showed charts to illustrate this point, taking measurements of boys from an Oxford preparatory school from 8 to 13½ years and older boys from Epsom College. It was interesting that Roberts's figures from the 'eighties, of height and age of boys, at public schools, naval and military colleges, and universities, and medical students, fell below what is regarded as ideal to-day. Fleming and Martin's statistics from Wales, including some elementary school-children, showed lower curves, while Greenwood's from elementary schools all over the country were lower still. Elderton's figures for Glasgow children taken by districts were all graded according to the social status. So in comparing the different classes of the community of varying social strata, while the height-weight curves were constant, the lower classes were less tall for their age, and practically speaking the social status could be graded by this property.

Prof. LEONARD FINDLAY was glad that Dr. Poulton had shown the fallacy of the height-weight index; these two were measurements of two totally different things—the height of growth and the weight of nutrition. There was a real difficulty with regard to standards; comparison of private patients with, say, Baldwin's measurements showed the former as sometimes as much as two or three years above the latter. Rate of growth of height and of weight varied much in different social classes. Another interesting point was the focusing of attention on the first eighteen months of life. In a study undertaken with Prof. Noel Paton, he had found that the rate of growth was strikingly greater during this period, and he thought that in questions of under-nutrition this was the period on which to concentrate if valuable time was not to be lost.

Dr. ALAN MONCRIEFF emphasised again the importance of considering the carbon dioxide output in estimating the metabolism in young children. The oxygen-consumption alone could be very fallacious. Secondly, he complained of the lack of proper growth standards for this country. Some years ago he had collected data from several foreign countries, and had found considerable variations. Yet we were content to accept as a standard figures from the mixed population of America. We could not begin to argue about malnutrition or undernutrition until we had standards for English children. He hoped that the promised and long-awaited anthropometric survey would shortly appear.

Dr. POULTON, in reply, pointed out that the height-weight relationship was only fallacious in so far as it was constant whatever class was studied. Brodie's figures for animals showed a difference between those fed improperly and those on adequate diets,

and he concluded that in this country all children got enough calories, and though a child could gorge himself on bread and gain weight, he would not grow taller. Possibly the difference in height in the different social strata resulted from lack of vitamins, and what was needed was more vitamin A, and perhaps D, rather than more calories. Dealing with the relation of height to weight, the height-age curve was straight, the weight-age curve flattened out, and height should be taken for measurement of growth. He wanted to stress the importance of weighing children naked. There was a real need for reliable observations on children from a statistical point of view.

SECTION OF UROLOGY

At a meeting of this section held on Jan. 23rd, Mr. E. W. RICHES being in the chair, a paper was read by Dr. J. LEON JONA, of Melbourne, on

The Kidney Pelvis

its normal and pathological physiology, illustrated by cinematography and pyelograms. In a preliminary anatomical survey Dr. Jona pointed out that the segmental character of the embryonic kidney was preserved in the adult calyces. These, together with the infundibulum of the pelvis and the ureter, were enclosed by layers of smooth muscle which were found, on pyeloscopy, to contract rhythmically in a manner which the speaker compared with the systole and diastole of the heart muscle. If the pelvis were filled with radio-opaque fluid through a ureteric catheter and observed on the fluorescent screen this action could be followed. The calyces contracted in regular order from above downwards, each contraction lasting from 1 to 3 seconds and being followed by a resting period of similar duration. The infundibulum contracted in a similar fashion and forced the urine down into the ureter. Regurgitation into the calyces was prevented by a kind of "snap" action of the proximal part of the infundibular recess. The cinematograph which followed at this point had been prepared by an artist to whom the speaker had demonstrated the sequence of events in the living subject. The film showed very clearly, by a synthetic series of diagrams, the rhythmic contractions already described.

Aberrations in the regularity of this mechanism were found in a variety of pathological states such as atony, spasm of the whole kidney pelvis, spasm of the ureter at one point, or atony of the ureter. Pyelograms illustrating these different conditions were demonstrated. Spasm was frequently reflex in origin and might be due to disease of the gall-bladder or appendix, inflamed lymph glands, or to an aberrant renal artery. Dr. Jona had even seen spasm of the left ureter in a patient with gall-stones. Atony and dilatation could occur in the absence of obstruction and might be due to the action of the sex hormones. Antiperistaltic waves were frequently associated with spasm of the ureter at one point; they were also observed in the ureters in apparently normal subjects when the bladder was distended and micturition prevented. Such antiperistaltic waves were an obvious mechanism in the production of pyelitis should the bladder be infected. The use of pyeloscopy might assist in the early diagnosis of renal tumours when the only clinical symptom was hæmaturia. In pregnancy the ureters were often enlarged by as much as two-thirds of their normal size, and this was often accompanied by elongation and kinking of the upper or free part of the ureter. Such a con-

dition was liable to persist in association with sub-involution of the uterus. Mr. Harold Burrows's observations on the effects of oestrogenic substances upon the musculature of the ureters were, said Dr. Jona, highly significant.

Dr. Jona demonstrated a graphic method of investigating pelvic pressure and contractility. In this the ureteric catheter is connected with a tambour and a record of the pressure is obtained on a revolving drum. With this apparatus he made a short record, using manual pressure on a rubber bulb in imitation of the conditions which would obtain in practice. Tracings in normal subjects, he said, showed a regular undulating curve corresponding with the rhythmic systole and diastole of the pelvis. A change from the horizontal to the sitting posture caused an appreciable increase in the intrapelvic pressure, as did also an increase of intra-abdominal pressure—for example, in deep inspiration. This graphic method of investigating the muscular activity of the urinary tract was of considerable service in distinguishing between cases of hydropelvis where the muscle would contract and those cases where atony prevailed. In the latter the addition of 10 c.cm. of fluid simply added to the distension without producing an appreciable rise in pressure. In such cases nephrectomy might be advisable, but it should always be borne in mind that if an obstructive cause could be found and removed a great degree of improvement was to be expected in the contractility of the pelvic musculature. The combination of pyeloscopy with graphic records of intra pelvic pressure was of considerable service in estimating the effects of drugs upon this part of the urinary tract. Thus, in one case, in which a tracing was demonstrated, a single dose of pituitrin had been effective in restoring a normal rhythm where dysfunction had previously prevailed. Both atropine and a small dose of histamine would cause a moderate rise of pressure. Acridine and mercurochrome had a similar effect which the speaker attributed to their action upon the muscle rather than to any antiseptic effect. One effect of aspirin was to lengthen diastole.

The observations described had all been made in women. Dr. Jona gave no account of his work on animals apart from a single experiment in which he demonstrated the deleterious effect of using too great a pressure upon the renal pelvis. In this the radio-opaque fluid had penetrated into the inferior vena cava and its branches.

DISCUSSION

Mr. YATES BELL said that in a series of 12 cases of renal pain he had found hypertonus of the pelvis in the majority. In one case, a girl of 12 who had suffered from intractable pyelitis for a period of from 4 to 5 years, an intravenous pyelogram was normal apart from the form of the calyces, which were small and globular. Pyeloscopy showed no contractions, but these were initiated by injecting 0.5 c.cm. pituitrin and, after a course of treatment with this drug, the patient's condition returned to normal.

Dr. N. S. FINZI considered that the modern fluorescent screen and improved X ray apparatus had been of enormous assistance in obtaining effective pyeloscopy. He thought that intravenous Uroselectan had superseded retrograde pyelography too extensively but there were indications that the pendulum was swinging back.

Dr. G. E. VILVANDRÉ suggested that the effects of pyeloscopy might be imitated by taking plates at

more frequent intervals in the course of a pyelogram. Ordinarily exposures were made at intervals of from 10 to 15 minutes; if plates were taken at intervals of one minute a record might be obtained of the contractions described by Dr. Jona. He also suggested that kinking of the ureter was fairly common and not by any means confined to pregnant subjects.

Mr. A. W. CUBITT discussed the bearing of intravesical pressure upon ascending infection of the urinary tract with special reference to cases in which prostatectomy had been performed. In such cases drainage of the bladder led to the conversion of a positive pressure into a negative one. He thought this might facilitate an ascending infection, and for this reason advocated complete closure of the bladder. He also described the relief of pain effected by atropine in a case of vesical stone.

Dr. JONA, in reply, remarked that cases such as Mr. Yates Bell had described were undoubtedly forthcoming if they were looked for. His only objection to Dr. Vilvandré's suggestion was based upon expense, which would be considerable. To Mr. Cubitt he expressed doubt as to whether the pelvis of the kidney would stand a negative pressure.

MEDICAL SOCIETY OF LONDON

Prof. G. E. GASK, the president, took the chair at a meeting of this society held at 11, Chandos-street on Jan. 27th, when Mr. V. ZACHARY COPE opened a discussion on

Acute Appendicitis

Even after the fifty years which had elapsed, he said, since Fitz's famous paper of 1886, the mortality from acute appendicitis was still considerable and did not show diminution. The main problems had always been to decide the best time to operate and how much ought to be done at the operation. J. B. Murphy of Chicago, than whom no one had done more to put the surgery of appendicitis on a sound footing and who had had an operative mortality of about 4 per cent., which would be considered good to-day, had emphasised the great importance of operating on all cases early and before perforation of the appendix. He had called this the first stage of the disease, applying the term "second stage" to that period, for about three days after perforation, when the inflammatory process was increasing and spreading. The operation, he had written, must then be a limited one: simple opening of abscess and relief of pus tension in the affected area, with the removal of the appendix if it were accessible and easily amputated. There should be the least possible separation of agglutinations. When the patient was apparently overwhelmed with intoxication, a simple incision was made and pus tension relieved with a large drainage-tube. In the third stage, the stage of subsidence of the acute symptoms, he had generally operated and let out pus. He had therefore operated promptly in nearly all cases. Where, however, the surroundings or low state of the patient and the absence of a competent surgeon contra-indicated an immediate operation, he had recommended Ochsner's treatment, with the warning that it required a great deal of judgment. Ochsner had aimed at changing a dangerous acute into a relatively harmless condition by inhibiting peristalsis and giving the peritoneum an opportunity to remove the infection by absorption or circumscription. He had not sought to avoid operation but had chosen the most favourable time for it. He had not only operated at once on every case in which he had thought

the appendix was still unperforated, but had often operated promptly upon appendicular peritonitis. For the past thirty years the majority of surgeons had followed the teaching of Murphy. During the last few years, however, a number of the younger surgeons had questioned the wisdom of prompt operation at all stages. They regarded cases in which symptoms had been present for fifty hours as suitable for delayed treatment; they put the patient in the high Fowler position, allowed no purgatives and gave no morphine. They allowed only water by mouth. They did not recommend delay in young children or where the diagnosis was uncertain, and they regarded as additional indications for operation the previous administration of a strong purgative, superficial hyperæsthesia, and obvious general peritonitis.

IMMEDIATE AND DELAYED OPERATION

The advantages of the so-called immediate operation were that the exact pathological condition was ascertained, the infective focus was usually removed, the infective field was drained where necessary, and the patients and relatives were saved a trying delay. Its disadvantages in cases with perforation of the appendix were said to be the danger of spreading the infection, the greater frequency of intestinal obstruction and ileus, and the frequency of secondary abscesses, fecal fistulae, and incisional hernia. The advantage of the Ochsner method was said to be that operation was undertaken when the infection was localised and the risk minimal. Its drawbacks were that if the infection did not become limited the patient might be in a worse state than before; extra work and strain were thrown on all concerned; treatment must be carried out on the threshold of the theatre by the surgeon himself; and delay with mistaken diagnosis might be fatal. There was a great deal of truth in these criticisms, but they were of varying weight.

Mr. Cope said he was doubtful whether statistics could solve the problem of which was the better method, and he thought there was need of a thorough investigation into the whole question of appendicitis mortality by a responsible and impartial body. From his clinical experience, in spite of the comparative and average success of prompt operation, he had from time to time had cases in which delay had seemed to be the better plan. He still always advised immediate operation, not only for the unperforated appendix but also for perforative appendicitis with diffuse peritonitis, so long as the patient was not too toxic and was reacting well to the inflammation. The cases which he decided upon their merits were those with a definite and circumscribed lump and those with advanced peritonitis. If he thought the lump represented a subsiding inflammation with perhaps a small, ill-defined abscess, he sometimes tried the starvation treatment of Ochsner. If he thought there was a well-defined abscess, he usually opened it. With advanced peritonitis and a toxic and dehydrated patient it was better to wait a few hours and sometimes a day or two while the patient was hydrated and detoxicated by intravenous and rectal saline. It would be a retrograde step to teach that delay was the usual correct treatment. Delay should not be practised except by experienced surgeons.

Mr. Cope described his own technique and, in conclusion, recommended that whenever possible an experienced surgeon should be in charge of any case of appendicitis.

EXPECTANT TREATMENT

Mr. R. J. McNEILL LOVE said that in appendicitis that had become limited to the right iliac fossa or

pelvis immediate operation might be extremely difficult. Although a practised surgeon could remove the appendix with the minimum of disturbance, many cases fell into the hands of the less experienced, whose operative results were buried in the records of their hospitals. The main points of expectant treatment were the four "F's": Fowler's position, fomentation, the four-hourly chart, and fluids by the mouth in minimal quantities. He had never felt very happy about fluids by mouth, but preferred intravenous infusion for four or five days. If expectant treatment was adopted for the localised condition, the disease followed one of three courses. In about 65 per cent. of cases the infection subsided and swelling disappeared, and three months later the appendix was removed at a clean operation with negligible mortality. In 25 per cent. of cases an abscess formed, showing that infection had become limited and resistance increased. Expectant treatment could be still carried on, but it was wise to drain the abscess. In 10 per cent. of cases expectant treatment must be abandoned because of increase of pain, tenderness, rigidity, and fever. The surgeon was then faced with the necessity of operating on a more toxic patient. Expectant treatment had been criticised on the ground, among others, that it was impossible to gauge the condition of the appendix. Once localisation had occurred, the surgeon knew something much more important: the condition of the surrounding peritoneum, omentum, and bowel, which were all acting as a wall to the inflammation. Discharging wounds and faecal fistulae were more common after the immediate operation. In suitable cases the mortality following expectant treatment was about 3 per cent. less than that obtained from immediate operation by experienced surgeons. The clean operation three or four months after the acute condition had subsided could be performed safely by a surgeon of less experience.

THE STATISTICAL ASPECT

Mr. H. C. W. NUTTALL, speaking of the statistical aspect, said that with a mortality of 2.53 per cent. he considered that he still had something in hand. Two points of view had to be distinguished: that of the full-time surgeon and that of the general practitioner who did a certain amount of surgery. The latter might easily be taught to operate carefully; it was more difficult to teach him to watch the patient. House surgeons must be taught never to attempt to remove the appendix if there were any difficulty. Hyperaesthesia was of very little value in diagnosis, as it was present in 50 per cent. of cases. The most difficult cases were those in which the condition had been established for some time and the surgeon could not tell where the infection had started and where to make the incision. Mr. Nuttall would still advise operation if the appendix region were incriminated. Some patients suffered severely from thirst unless they were given water by the mouth; to do so made little difference to the abdomen if the drainage were adequate. In the vast majority of straightforward cases he did not drain, but he always drained for the slightest amount of haemorrhage, for a blood-clot in an infected abdomen was very serious. He did not regard the diminution of mortality-rate by 3 or 4 per cent. by the expectant treatment as good enough; the immediate operation gave better results in the end over a large series of cases.

Mr. HUGH WHITELOCKE stated that at the Radcliffe Infirmary, Oxford, the staff delayed operation only in two or three cases a year, yet the figures had improved for two reasons: the introduction of continuous intravenous drip in severe toxic cases,

and the careful suction of local peritonitis, particularly from the pelvis. He had rarely drained by a stab incision over the pubes. By inserting a tube drain to the base of the pouch of Douglas and by withdrawing it about half an inch every day with a slight rotation, almost any pelvic abscess could be satisfactorily drained through a lateral gridiron incision.

Mr. JULIAN TAYLOR adduced as a reason for the low mortality at University College Hospital that the honorary staff dealt with practically all appendix cases. If the surgeon were experienced, it did not matter which principle he followed. The general presumption of the exponents of delayed operation that patients died from the dissemination of infection from an abscess was quite wrong; this was the rarest possible occurrence.

Mr. G. H. COLT said that some drainage statistics which he and a colleague had compiled and shown to a professor of statistics had illustrated the danger of any but a lateral incision. The mortality from an appendix abscess was approximately 3 per cent., but from spreading peritonitis it rose to 80 per cent. at about the tenth day. When the appendix and the more local inflammation had been removed and the operator saw clear lymph pouring into the local focus, he should leave a tube in for a short time; otherwise the risk was less if no drain were used. The difficulty lay in deciding what and what not to leave.

Mr. W. E. TANNER remarked that in some cases where the appendix was bound down to the back of the abdominal wall and the caecal end was healthy he had divided the caecal end, invaginated the caecum, pulled out the mucosa of the appendix, and inserted a drain; the patient was saved a second operation. When a very old patient had an appendix of this type a transfusion of 200 c.cm. of blood would promote local suppuration and the patient would get better. This was far superior to giving vast quantities of fluid intravenously.

Sir JAMES WALTON also considered that the important factor was not so much the method as the man who carried it out. The important thing was the teaching which the surgeon was to give to students. Every general practitioner was likely to regard himself as a skilled surgeon for the purpose of deciding on delay. The enormous improvement in results had been due to the fact that practitioners were learning to send cases up for early treatment. When an abscess was localised and well defined the surgeon should always operate, and the only question was whether the appendix should be removed. There were three factors: what the patient would stand, how difficult the appendix was to get out, and how quickly the individual surgeon could get it out.

Mr. J. E. H. ROBERTS agreed that a new body of statistics should be obtained from hospital surgeons. A form would have to be filled up when each case was seen and the treatment was planned, and the material would have to be submitted to a professional statistician. A clear exudate in the peritoneum did not necessarily mean general peritonitis but might be due to infection passing through the walls of an unruptured abscess. He could not believe that when there was a general infection of the peritoneum and the source of infection continued, it was not advisable to remove the rest of the appendix.

Prof. J. PATERSON ROSS considered that the main argument for delayed treatment arose when the abscess was diffuse in the peritoneal cavity. Even with a diffuse peritonitis he removed the appendix, just as he would remove a rusty nail from an infected knee-joint. After that, the Ochsner treatment was the right one.

REVIEWS AND NOTICES OF BOOKS

Gefäß erweiternde Stoffe der Gewebe

By J. H. GADDUM, Professor of Pharmacology at University College, London. With an introduction by H. H. DALE, Director of the National Institute for Medical Research, London. Leipzig: Georg Thieme. 1936. Pp. 200. R.M.18.

A LARGE number of pharmacologically active substances can be isolated from living tissues. Some of these, for instance the hormones, adrenaline, and pituitrin, are obtained from highly specialised cells and bring about an increase in vascular tone. Others may be prepared from a large variety of tissues and give rise to vasodilatation when injected into animals; it is with these substances that this monograph deals. Sir Henry Dale discusses their general nature and significance in an introductory chapter. Three are chemically well-defined substances of known constitution—namely, histamine, acetylcholine, and adenosine. The evidence is in favour of the view that histamine and acetylcholine, at least, exist in the cells in an inactive combination and are released when the cells are stimulated or damaged; after their release they tend to produce local rather than general effects. A short historical review is given, and it is interesting that these substances were well known chemically before their physiological significance was realised. Prof. Gaddum begins with a very useful section outlining the methods generally available for the study of vasodilators present in tissue fluids and extracts. Histamine, acetylcholine, and adenosine compounds are fully dealt with in separate chapters. A very useful section follows in which substances of unknown constitution present in extracts of various organs are discussed, such as the "heart hormone" of Haberlandt, Kraut and Frey's "kallikrein," and Gley and Kisthinos's "angioxyl." The evidence for the separate identity of these various substances is examined critically, and the information provided will be of particular interest to clinicians who are offered preparations containing such substances as their active principles. These earlier sections are likely to be used mainly for reference purposes; the later ones have a more general interest.

In recent years evidence has rapidly accumulated showing that the action of many nerves is brought about through the liberation of chemical substances at their endings, a conception which though not new had previously been based on scanty experimental data. Convincing evidence in favour of this view is given and the whole subject is fully reviewed. Sir Henry Dale has coined the term "cholinergic" for nerves in which acetylcholine or some closely related substance is the transmitter, and there is now evidence to show that probably all pre-ganglionic autonomic fibres and all post-ganglionic parasympathetic fibres are cholinergic, as are the motor nerves to striped muscle. "Adrenergic nerves," that is to say, nerves which act as if adrenaline or some related substance were produced when they are stimulated, are also dealt with in this section, although strictly they do not come under the general title of the monograph. In the final chapter recent additions to our knowledge of several topics of general interest are outlined, including local chemical mechanisms regulating the circulation, anaphylaxis, and traumatic shock.

An excellent bibliography is provided and a good index. The book is indispensable to those working

on pharmacological or physiological problems, and contains much information of value to the physician (who can read German) interested in the fundamental bases of medicine.

Essentials of Cardiography

By H. B. RUSSELL, M.D., M.R.C.P. Lond., Medical Officer in Charge of the Cardiographic Departments at St. Thomas's and the Royal Masonic Hospitals, London: J. and A. Churchill Ltd. 1936. Pp. 82. 7s. 6d.

THIS small book contains the essentials of electrocardiography and of radiological examination of the heart (orthodiagraphy) presented in an elementary form for the use of students.

In the first section, the different types of normal and pathological electrocardiogram are portrayed and simply yet clearly described. With a few exceptions the illustrative records are quite good, but the deflections are unlabelled which is a serious defect in a book intended for students. The second section of the book, dealing with radiology, is elementary but not very accurate. Some of the illustrative orthodiagrams are crude and the interpretation given is in several instances open to question. The anatomical diagrams might have been better, and that of the first oblique position is incorrectly labelled. Enlargement of the left auricle is not described, though it is mentioned as affecting the left heart border. The value and importance of radiological examination of the heart exceeds that of electrocardiography to-day, and some account of the method is required by students. If this section of the book were improved and slightly expanded, it would fulfil this requirement.

Principles of Bacteriology

Sixth edition. By ARTHUR E. EISENBERG, A.B., M.D., Director of Laboratories, Sydenham Hospital, New York; Member, New York Pathological Society, New York; and MABEL F. HUNTLY, R.N., M.A., Director of Nursing, Wesson Memorial Hospital, Springfield, Massachusetts. With annotations and a section on Microbic Variations by F. E. COLIEN, M.S., Ph.D., Professor of Bacteriology, Vocational School, Milwaukee, Wisconsin. London: Henry Kimpton. 1935. Pp. 378. 12s.

THIS is an American work designed as an introduction to Bacteriology for Nurses. In this country it would be considered unsuitable for such a purpose as it is against our educational rule to demand so much in the way of theoretical knowledge from nurses, most of whom have had but scanty general scientific training to serve as a foundation. This book is not likely to arouse enthusiasm for the American system of instruction. We find, for example, descriptions of such uncommon diseases as coccidial granuloma and sprue (said to be due to monilia!), but the treatment of such interesting and important subjects as diphtheria or streptococcal disease is quite inadequate. What can a nurse profit by reading a few paragraphs on such highly uncertain subjects as local immunity, Rosenow's elective localisation or bacteriophage, not to speak of the side-chain theory, bacterial variation, or the technique of the Wassermann reaction? An unfortunate feature of the book is the form in which many of the questions are put; a statement has "T"

and "F" written in front of it with the instruction to circle the "T" if the statement is true, the "F" if it is false. Here are a few examples. "The gonococcus is a streptococcus," "Dr. W. H. Park is the head of the New York Board of Health Laboratories," "Drs. George F. and Gladys H. Dick found the cause of pneumonia to be a streptococcus." We know that nurses often have to do their reading when they are too tired for any mental effort, but this is surely going too far in "spoon-feeding." It might even dawn on the tired reader that if she answers sufficient questions and uses the throw of a coin to make her decisions she will be practically certain to score a comfortable 50 per cent. It is fair to say that as the book has reached a sixth edition it cannot have failed in the purpose for which it was intended.

Modern Sociologists

1. PARETO. By FRANZ BORKENAU. London: Chapman and Hall. 1936. Pp. 219. 6s.

2. TYLOR. By R. R. MARETT, M.A., D.Sc., LL.D., Rector of Exeter College, Oxford. Same publishers. 1936. Pp. 220. 6s.

THESE two volumes owe their production to recognition by the publishers of a growing interest in social science, and the result is the issue of a series of sociological studies under the general editorship of Prof. Morris Ginsberg, professor of sociology in the University of London, and Mr. Alexander Farquharson, general secretary of the Institute of Sociology of London. The books are not intended to serve only as students' text-books, but the selection of both authors and subjects has been made with a view to supplying a systematic introduction for any intelligent reader to the best of modern thinking about the social world in which we live and work.

1. Pareto, born in 1848, was of aristocratic Italian descent, but his father was for some years a refugee in France and the son began his education in Paris. The father was a Mazzinist but the son showed marked antagonism towards the family tradition. Pareto became an engineer and while quite young obtained a considerable position in his calling, but he was never able to make his opinions fit with his career. He was caught between a government which was not renouncing economic State intervention and the revolutionary Socialist party. His attacks on economic protection developed into attacks on the government, and his situation became impossible. Being a comparatively rich man he retired from public life, and by a fortunate accident secured a chair at the University of Lausanne, whence came a series of writings whose bitterness was due to his position between two incompatible attitudes, but whose teaching was none the less valuable. Pareto died when Fascism had been only a year in existence so that, although in many directions his views might have coincided with Fascism, there is hardly evidence strong enough to justify the claim of the Fascists that Pareto was their chief precursor. Dr. Borkenau's closely explanatory description of Pareto's teaching will be welcomed by students of sociology.

2. Edward Tylor was a Quaker and was taken away from school too young to make it likely that he would develop into a scholar in the narrow sense of the word. In the widest sense he became a pre-eminent scholar, for admittedly his studies in anthropology made him the most learned man of his day over the vast field implied, though evidence forthcoming during the 20 years since he died would have extended his outlook and might have modified some

of his theories. His studies originated in a happy and accidental meeting in Cuba with the famous ethnologist Henry Christy. They travelled through Mexico together and Tylor's first book, "Anahuac," records their experiences. In 1860 he showed himself the learned anthropologist that he already was, in a volume entitled the "Early History of Mankind," published in 1865; here he proved the width and importance of his studies, and when in 1871 the classic work "Primitive Culture" appeared he became celebrated, gaining election as an F.R.S. while still under 30, and shortly afterwards the D.C.L. Oxf. Prof. Marett's exposition of Tylor's work makes good and valuable reading. Such chapters as those on Society and on Material Culture show how great a man Tylor was and the important directions in which he was a pioneer, and the chapter setting out the connexion of religion and animism explains a direction of Tylor's researches with which his name is especially associated. This is a really useful little book.

A Doctor's Odyssey

A Sentimental Record of Le Roy Crummer: Physician, Author, Bibliophile, Artist in Living, 1872-1934. By A. GAYLORD BEAMAN. London: Humphrey Milford, Oxford University Press. 1935. Pp. 340. 11s. 6d.

THIS is an intimate picture of a man who had a large number of medical friends and connexions and deserved his position and popularity. Physician, book-collector and virtuoso, traveller, artistic critic, and gourmet, he touched life at many angles and always received and communicated impressions. The author describes the biography as "a sentimental record" and plays Boswell to his Johnson with admiration and without criticism. The chapter describing in detail the collection of books which Dr. Crummer made includes interesting notes on his activities as a collector and repeats his amusing little estimates of characteristics of both the shop and the shopkeeper at the various marts which he visited. The Crummer collection is now in the possession of the University of Michigan and will there remain a memorial of a very interesting personality.

Quarterly Journal of Medicine

THE January issue contains the following papers:—
Erythrocyte Sedimentation-rate in Diseases of the Heart, by PAUL WOOD (see p. 271).

Observations on the Treatment of Myasthenia Gravis:—A. M. COOKE and R. PASSMORE give the results of the use of various therapeutic measures on myasthenia gravis in a girl of 13 years. They found that glycine, acetylcholine, and Parathormone produced no clinical improvement, whereas Prostigmin by injection led to complete relief of symptoms for four hours, while eserine and ephedrine by the mouth gave a lesser but much more prolonged improvement. They also studied the creatine and creatinine metabolism in this patient and formed the opinion that the biochemical lesion is not an inability to form creatine from its precursors but rather an inability to metabolise creatine properly.

Glycogen Disease (von Gierke's Disease) by R. W. B. ELLIS and W. W. PAYNE.—This paper is illustrated by a detailed account of seven cases. The familial incidence of many of them is demonstrated and it is suggested that the condition may possibly be inherited as a Mendelian recessive character.

Two Cases of Muscular Degeneration Occurring in Late Adult Life.—S. NEVIN reviews the recorded cases of late progressive muscular dystrophy. Pathological and biochemical examinations of the affected muscles obtained at biopsy were made on these two cases, and changes were demonstrated differing at least in degree from those characteristic of progressive muscular dystrophy.

Achrestic Anæmia.—M. C. G. ISRAËLS and J. F. WILKINSON give an account of a group of cases of megalocytic anæmia which do not fit into the categories so far described; closely resembling pernicious anæmia, but differing from it, especially in course, prognosis, and treatment. This class of anæmias they term "achrestic" because they seem to represent a failure to utilise the anti-anæmic principle. The distinguishing characteristics are shown to be a megalocytic anæmia, the presence of free HCl in the gastric juice, failure to respond properly to anti-anæmia therapy, megaloblastic hyperplasia of the bone-marrow, and a prolonged course, eventually fatal.

Leucocytosis in Typed Lobar Pneumonia.—JOHN FLEMING reports observations on the leucocyte count in pneumonia on a series of cases in which the special type of pneumococcus concerned has been determined. He is able to show that during the first three days of illness a leucocytosis of over 20,000 is characteristic of most cases of Type I. lobar pneumonia, while a leucocytosis of less than 20,000 is usually found in Type II. pneumonia; further, that the leucocyte count is of prognostic value when the type of organism, the age of the patient, and the duration of the illness are all considered.

Gargylism.—R. W. B. ELLIS, W. SHELDON, and N. B. CAPON describe a syndrome characterised by bone changes, a peculiar facies, congenital clouding of the corneal, abdominal distension with enlargement of the liver, spleen, and mental deficiency. They report in detail seven cases personally observed, and review ten cases from the literature.

British Journal of Surgery

THE January issue (Vol. XXIII., No. 91) contains the following papers:—

Spondylitis Ankylopoietica, by F. CAMPBELL GOLDING (London). An account of the radiological findings in 91 cases. Early joint and muscle pains occurred in the majority; the opinion was reached that sacro-iliac disease antedated by several years the spinal changes.

An Improved Technique for the Introduction of Radium Needles in the Treatment of Carcinoma of the Breast, by R. BROOKE (Chichester). The radium needles are contained in hollow trocars passed through the breast substance and fixed at each end in a rigid frame.

Further Observations on the Disturbance of Metabolism Caused by Injury, with particular reference to the dietary requirements of fracture cases, by D. P. CUTHBERTSON (Glasgow). A diet rich in first-class protein and of high caloric value appeared largely to mitigate the drain on the body nitrogen.

Œsophagectomy for Carcinoma of the Thoracic Œsophagus, by E. S. J. KING (Melbourne). Report of a successful operation by the transpleural route; preliminary gastrostomy and artificial pneumothorax had been performed.

Gastric Diverticula, with report of a case before and after operation, by G. A. EWART and G. R. MATHER CORDNER (London). Clinically there is no characteristic picture, and the operation is difficult. The X ray diagnosis is discussed in detail.

A Method of Treating Fractures of the Lower Limb: Use of a Combined Counterpoise and Traction System with a Thomas Leg Splint and Hinged Knee-piece Attachment, by A. LEWER ALLEN (Johannesburg). The splint is so suspended that it is used as a finely balanced, first-class lever, the site of fracture and the fulcrum coinciding.

Renal Rickets and Dwarfism: A Pituitary Disease, by BRUCE CHOWN (Winnipeg). In two cases described the association of dwarfism, polyuria, and urinary tract dilatation suggest a pituitary-diencephalic lesion. Such a lesion was found in the second case. The nephritis is regarded as secondary to an abnormal mineral metabolism.

Isolated Dislocation of the Base of the Fifth Metacarpal, by NORMAN ROBERTS and C. THURSTAN HOLLAND (Liverpool). Forward and inward dislocation (three cases reported) is easily reducible by traction, but requires prolonged extension. Outward dislocation into the palm (one case) may require open operation.

Rupture of the Long Head of the Biceps Brachialis, with notes on four cases, by H. A. H. HARRIS (Chelmsford). Two cases were successfully treated by suture of the long head of the biceps to the coracoid process of the scapula.

Progressive Post-operative Cutaneous Gangrene, by H. T. COX (Manchester). A case is reported which showed extensive sloughing and a definite zone of black gangrene. Histologically the process was limited to the true skin. Operation was successful.

Intravenous Pyelography in a Series of Cases after Transplantation of the Ureters, by G. GREY TURNER (London) and J. H. SAINT (Newcastle). Investigation in six cases showed satisfactory renal function in five; in one only was there impairment on both sides, and that was partial. The action of the whole colon as a urinary reservoir was demonstrated.

A Gridiron Access to the Biliary Apparatus, by C. JENNINGS MARSHALL (London). An external rectus incision is carried down to the posterior layer of the rectus sheath and through the posterior lamina of the internal oblique aponeurosis. The transversalis is divided by transverse incision.

Mucoid Carcinoma of the Cæcum in a Boy of 13 Years, by ROBERTSON F. OGLVIE (Edinburgh). The diagnosis at operation was tuberculosis of the cæcum. Death occurred by generalised metastasis.

Anterior Dislocation of the Hip, by J. A. MACFARLANE (Toronto). Open operation was required in a case of suprapubic dislocation, although attempts at manipulative reduction were made immediately after the accident.

Calcified Cyst of the Pericardium, by A. DICKSON WRIGHT (London). A hæmatoma, caused by a blow with a hockey-ball, became encapsulated and calcified. Successful removal is reported.

A Chloride-secreting Papilloma of the Gall-bladder. A Tumour of Heterotopic Intestinal Epithelium: with a critical review of papilloma of the gall-bladder, by A. B. KERR and A. C. LENDRUM (Glasgow). Cholecystostomy was followed by such excessive chloride loss as to prove fatal.

The Treatment of Acute Mammary Abscess by Incision and by Aspiration, by R. J. V. BATTLE and G. N. BAILEY (London). A method is described of treatment by repeated aspiration and washing out with Dakin's solution. The indications for this method and for incision are discussed in five types of breast abscess.

The Influence of Œstrogenic Compounds in Causing Hernia and Descent of the Testis in Mice, by HAROLD BURROWS (London). Œstrone has been found to inhibit or prevent descent of the testis. Scrotal herniæ are induced by every potent Œstrogenic compound, but only in the presence of a mature or nearly mature testis.

An Experimental Method of Providing a Collateral Circulation to the Heart, by LAURENCE O'SHAUGHNESSY (London). A pedicled omental graft has been applied to the surface of the heart, the experiments being carried out in 14 cats and 2 dogs.

There is an account of a visit to the surgical clinic of the St. Vincent's Hospital, Melbourne; and also reports on cases of special interest and rarity.

AN INTERESTING AMALGAMATION.—A notice appears in the current *Riforma Medica* announcing an amalgamation for subscription purposes of the three Italian medical journals, *Il Policlinico*, *La Riforma Medica*, and *La Minerva Medica*. The communication points out that such a conjunction offers to the medical profession the opportunity of keeping in touch with all professional activities in much more convenient circumstances through the medium of the three great magazines. The combined subscription to the three journals is 150 Lire in Italy, and the subscription can be sent to the managers of any of the three papers; it can be made in two sums of 75 Lire each, the first of which is due now, the second instalment falling due on June 30th. Subscribers to the three periodicals will not only receive the journals at this reduced price, but will be allowed a discount of 10 per cent. on all the publications of the journalistic group P.R.M. It is suggested that by placing the subscribers in a position to estimate the progress of medical literature in a very convenient manner they will reap advantage, while the journals will be able to realise through the union a valuable conjunction of work and influence and stability.

THE LANCET

LONDON: SATURDAY, FEBRUARY 1, 1936

PHYSICAL STANDARDS IN INDUSTRY

IN his opening address on Jan. 24th to the newly formed Association of Industrial Medical Officers Sir DAVID MUNRO remarked how difficult it had been since the war to obtain systematic data about the physical condition and state of health of any large groups. The report by National Service medical boards upon the physical examination of 2½ million men of military age in 1918 had given rise to alarm at the time, but statistical criticism had since shown that except for youths of 18 the examinees could not be regarded as a representative sample of the nation's manhood. But that census did show a mass of remediable defects among those of an age to start on an industrial career; and recent rejections of recruits for the Army and Air Force told the same story. At the head of the causes for rejection stood such items as loss and decay of teeth, deformities of feet, defects of vision and hearing—in particular middle-ear disease—and heart trouble, many of them remediable defects. Prof. E. P. CATHCART's investigation for the Industrial Health Research Board included measurements of height, weight, and strength in men representative of every section of the working community, but it had not been found possible to correlate these measurements with the disabilities causing rejection, although again there was no question of the magnitude of the remediable defects. Bearing all this in mind, Sir DAVID went on to suggest that medical officers in whole-time employment with industrial firms were probably better placed than any other scientific men or administrators for getting information about physical fitness or unfitness. What he would like to see was some system of setting out essential data of physique and disabilities found on entry and of recording them on some kind of agreed form, so that the data collected would be comparable firm by firm. It should also, he hoped, be possible to keep a record of the numbers rejected and of the causes of rejection, which would throw light on the known gaps in our existing health services. He would also like to see the data of physical states at entry and causes for rejection, followed by a comparison of those who are successful in industry, entered on these standards, with an unsuccessful group. If a medical record of sickness could be kept for every one of the personnel followed up, it would surely throw much more light than we have at present on the causes, incidence, and prevalence of occupational disease; and here again the entries should be on an agreed form comparable between one firm and another, for the key to advance in knowledge of occupational disabilities is accurate diagnosis. What he was suggesting was in fact a

piece of combined research in which the Research Board could assist. The first step towards such collaboration would be for medical officers to send to the Board such records as they now keep; with the aid of expert medical statisticians it should then be possible to see what can be made of existing systems and what is required for coördinating further information. Sir DAVID MUNRO touched on the difficulty, well known to the Research Board, that operatives are shy of medical examinations. These objections on the part of the worker (to quote the introduction to one of the Board's annual reports) are easy enough to understand and are due partly to the spectre of unemployment which is always before his eyes and partly to there being many things about medical examinations, as he has experienced them, which offend his sense of fair play. To both of these factors is due a suspicion that, if the slightest physical defect is shown in the examination, it will be recorded against his name, and should the management have anything against him it will serve as an excuse to get rid of him; for he must know that physical unfitness is often an excuse for dismissal. Sir DAVID was hopeful that the Association would be able to collect the information without exciting prejudice. What he had in mind was strictly a piece of research. There was no intention of making an official collection of sickness statistics in rivalry with those of the Ministry of Health and the General Register Office.

RADIOLOGY IN RELATION TO OBSTETRICS

ALTHOUGH in the past few years, as the result of improvements in apparatus and the development of new techniques, the place of radiography in the study of the pregnant woman has been generally realised in continental countries and in America, obstetricians in this country have not availed themselves of radiographic facilities to the same extent. At combined sections of the Royal Society of Medicine, where the subject was discussed last week, Prof. FLETCHER SHAW divided the blame between the obstetrician and the radiologist; while the one had been slow in utilising radiological methods, the other had been slow in developing the technique. It would now appear that the obstetrician is at last becoming cognisant of the great help he may receive from X ray examination of his patients; introducing the discussion Prof. D. DOUGAL said that in every maternity hospital it was essential to have a radiological department equipped and staffed for diagnosis and research. It is to be hoped that this standard will now be generally accepted, sight not being lost of the fact that X ray examination is supplementary to but does not supplant thorough clinical examination. Further, in order that the utmost may be obtained from his work, the radiologist should be in full possession of clinical data about the patient, since in all radiological investigations it is by correlation of the clinical and radiological evidence that the ultimate diagnosis is reached. In addition, if antenatal radiography is to advance, the radiologist should

be informed of all pertinent events subsequent to his examination; from a consideration of these he will learn what modification in technique may be required to get even better results. In the early months of pregnancy a positive diagnosis may be established by radiography at the sixteenth week; by this time the vertebral bodies and the vertex of the skull are ossified sufficiently to cast characteristic shadows. It is perhaps not too much to hope that further refinement in technique may demonstrate foetal parts as early as the twelfth week. The Aschheim-Zondek test is positive much earlier than this, but the demonstration of foetal parts is incontestable.

Radiographic pelvimetry has proved its value; with radiograms taken under standard conditions it is possible by a simple calculation to determine the diameters of the pelvis. Measurements should be made as early as possible before the uterine contents obscure the definition. At the same time as the pelvic diameters are ascertained it will be possible to exclude deformities of the pelvic inlet, whether due to congenital abnormalities, skeletal dystrophies, or local bone disease. The information thus gained may lead the obstetrician to anticipate difficulties which might be encountered when labour commences. As gestation advances radiography is of help in determining multiple foetuses, in recognising abnormalities of the foetus, and in estimating the maturity of the foetus more accurately than can be done by calculation from the date of the last menstrual period. Towards term the position and presentation can be shown on the film, information that is not always certain even when the clinical examination has been made under general anaesthesia. About the value of cephalometry or the mensuration of the foetal head there is more difference of opinion; during labour it is the bony pelvis which is rigid, whereas the foetal head is capable of alteration in its diameters. But Dr. L. N. REECE is confident that cephalometry may be used to fix the last moment at which the head will pass through the birth canal. In the diagnosis of placenta praevia two radiographic methods are available. In the first the amniotic fluid is rendered radio-opaque by the injection of a medium like Uroselectan B when the placental site will be shown as a defect in the shadow of the amniotic fluid; this method, known as amniography, is not free from the risk of inducing premature labour and foetal death. In the second method the bladder is filled with a solution of sodium iodide, when a central or marginal placenta praevia is revealed by an alteration in the position of the shadow of the foetal head in relation to the superior outline of the bladder. In the diagnosis of pyelitis of pregnancy help may be had from intravenous urography in assessing the excretory power of the kidneys and the degree of enlargement of the renal pelvis, their calyces, and the ureters; when the diagnosis has been made serial urograms may be used as a guide to treatment. Over and above all this, should the pregnant woman present signs or symptoms of intrathoracic mischief the radiologist should be called in.

It has been argued that antenatal radiography is unnecessary since the majority of labours terminate normally, but as Prof. DOUGAL remarked at the R.S.M. discussion this argument would apply just as much to clinical pelvimetry. And surely the early recognition of abnormalities, maternal and foetal, will do something towards reducing mortality? The demonstration of multiple foetuses will prepare the mother for unexpected additions to her household, while the demonstration of foetal abnormalities will prepare the obstetrician for difficulties in the conduct of the labour and may in some instances lead to the induction of premature labour. Reckoned in terms of money, X ray examination looks expensive in comparison with other methods of investigation; but its routine use would soon bring down the cost considerably, and complications avoided should be entered on the credit side.

AN ELOQUENT GOOD-BYE

A FEW days ago Lord HORDER marked the end of his term as physician to St. Bartholomew's Hospital by addressing his colleagues at the hospital and the students in a farewell address. The address, with which the issue of THE LANCET opened last week, is an able review of the situation of clinical medicine, in which the author traces in wise and witty terms the main reasons for its present position, and closes by pointing shrewdly to a place where the clinical training of students might well be and could easily be bettered.

The orator testified to being a personal witness in his own time of three great advances in the science and art of clinical medicine which have rendered the doctor of greater service to the patient. That he would mention two of these advances would be immediately guessed, for it is plain how immeasurably, whether in the field of the internal physician or in that of the surgeon, precision of diagnosis and treatment has been gained through radiology; and equally plain is it that the correlation of laboratory methods with ward work has brought about similar enlightenment to the physician of the day that was denied to an older generation. But to the wisdom and skill of that older generation Lord HORDER paid tribute when he pointed out that, although deprived of the opportunities for more accurate knowledge enjoyed by their successors, they were able to meet difficult situations often in an astonishingly pertinent manner through cultivated powers of observation. Consultation of obituary notices of our forefathers will show how often they had impressed their contemporaries by their apparently intuitive knowledge; apparently they guessed, for it might happen that the surmise turned out to be correct when its author could not supply hard-and-fast reasons, but really they were deducing their view from things detected by their sharpened senses, though unrevealed to those less fortunately endowed. The other factor to which Lord HORDER attributed the main progress in clinical medicine is relevant here. It is the increased frequency of and greater thoroughness in post-mortem examinations. "The clinician,"

he says, "began to think morbid-anatomically." That is exactly what the old observer was doing, though he had not the same chances which his modern example enjoys of ascertaining in the dead-house whether his solution of the cross-tissue lights had been correct. It is clear from older medical literature that great importance was attached by many physicians to the lessons of post-mortem pathology, but the facilities for learning the lessons of the post-mortem room were even in times comparatively recent very scanty at many institutions. It is a notable advance in clinical medicine that the better opportunities should be more generally utilised.

Particular attention may be drawn to Lord HORDER's suggestion that in one place the medical education of the senior student could be definitely improved to the saving of his time, and the advance of his appreciation of clinical work. His actual words are:

The fundus oculi and the membrana tympani are normal anatomical structures, yet few clinical clerks have ever seen them before they enter the wards and, largely as the result of this fact, some have not seen them clearly even when they leave. We could profitably exchange the time spent over theories of colour vision and the intimate structure of the organ of Corti for these important matters. The blood-cells are a part of normal histology, but they have rarely been counted, or, if they have, it has only been during the demonstration of the Thoma-Zeiss pipette. The contours of the abdomen, the reflexes

and tendon-jerks, the normal gait, the surface markings of the lungs, the deposits that may occur in urine apart from disease, the flora of the faeces in health . . . is it really economical that the time of the clinicians—and of the senior clinicians—should be taken up in teaching about these things?

Similar observations have been made by the orator himself and by others in the recent discussions of the medical curriculum. And in the many places in which practical reform has lately taken place no doubt the criticism has been met, but it is a point which all teachers in all schools might well remember. While abstaining almost wholly from reference to himself in his eloquent farewell words, Lord HORDER, we may be certain, is here alluding to a situation in medical training, the effect of which he has often felt personally. To a great teacher nothing is more baulking than to find that the lessons which he is striving to convey are rendered of little use to his audience by their lack of fundamental knowledge, and all the members of hospital staffs will remember to have been hampered in their educational work in this manner. Also many a man, looking back on his career as a student, will wish that he had been made to lay down as part of his regular routine that foundation for work which later he was compelled to construct, as best he could, beneath an erection already to some extent elaborated. Lord HORDER's words are very timely.

ANNOTATIONS

WHAT'S HIS NAME?

It is in keeping with current tendencies in medical psychology that disorders of memory are chiefly regarded from the standpoint of emotional interference. Where a memory has been lost or falsely recalled, it is in such mechanisms as repression that we are apt to seek the explanation, unless concussion or some other crude damage is to blame. Engrams and biological memory do not preoccupy us as they did the readers of Semon, although the ancestral memory of Jung and the organic mneme of Rignano are not far removed from Semon's conceptions. Among non-medical psychologists to-day there are some who have studied the development of memory in young children; but there are few, medical or otherwise, who have investigated how this function behaves during the later life of a normal person. To read psycho-analysts, one might suppose that a man would have every experience from the cradle to the analytic hour available to memory, if only the appropriate conditions for its recall could be analytically brought about; to read the psychiatrists, one might suppose that between the extremes of arterio-sclerotic or senile dementia on the one hand, and the boasted mental vigour of a Cornaro on the other, there is no change in the powers of memory that one may look for among men who had reached or passed middle life, no failure that comports with the slow physical changes that betoken age without presaging decay. Yet we all know, in ourselves or our intimates, how insensibly the recalling of names and dates becomes less prompt and easy as the fifties pass into the sixties. It has been pointed out that such a falling-off may be compatible with

continuously productive mental work within an accustomed sphere, though unexpected demands upon the memory, or emotional disturbance, will be likely to accentuate the affection. It is perhaps significant that some elderly writers on these topics have said that the function of memory is in a certain regard inversely proportional to intelligence; people with exceptionally good memories produce nothing new because they do not "work over," and unconsciously modify, their material as less gifted people do. Hence, thought Kraepelin, the few hours of sleep that these fellows of prodigious memory usually require; they do not have to use sleep for working over their memories, as the rest of us must. Forel declared that forgetting is one of the conditions of intelligence. Against these partial views may be set the words of Pascal, a man as phenomenal in memory as in intelligence, who wrote (*Pensées*, Article XXV., 14): "La mémoire est nécessaire pour tous les opérations de l'esprit." Certain it is, that to be unable to recall at need is a provoking experience to those who have been accustomed to find their memories loyal and prompt. The order of these lapses is unclear. Although for the grosser defections, Ribot's law of regression may suffice, the much commoner elusiveness of names must be brought under some other rule. Bleuler,¹ unrepentant apostle of associationism, would have it that substantives go first, and especially concrete ones, because in them the word is less important than in the case of verbs and conjunctions and other indications of a relationship; for the mental representation of the concept "Jackson" or "table" the word is

¹ Bleuler, P. E.: *Naturgeschichte der Seele*. Berlin: Julius Springer, 1932.

scarcely necessary, the image of the object sufficing, whereas in the case of abstract images the word supplies the simplest and clearest component which can easily release definite associations or can itself be stirred readily from without into activity. Bleuler's treatment of the matter raises issues that can scarcely be studied without regard to the verbal and nominal losses in aphasia—and to begin to discuss aphasia is to open the floodgates, if not to plunge into the bottomless whirlpool.

ROUTINE EXAMINATION OF MILK FOR TUBERCLE BACILLI

WHEN milk is to be tested by guinea-pig inoculation for the presence of tubercle bacilli the technique adopted must depend on a compromise between accuracy and expense. A single guinea-pig is liable to die prematurely, and if there are very few bacilli in the milk they may not produce lesions in every animal. An attempt has therefore been made by Mattick and White¹ to estimate the increase in efficiency obtained by inoculating two guinea-pigs per sample in place of one. Their findings are based on examination of 4775 samples, of which approximately 3100 were bulk samples while the rest came from individual cows. From the results it is calculated that if 1000 bulk samples were tested by inoculation of a single guinea-pig 84 reinvestigations would be needed because of premature death whilst 62 positive samples would be falsely reported as negative. If two guinea-pigs were used instead of one, only seven reinvestigations would be needed because of the premature death of both animals, and only four false negative results would be returned. These figures make very clear the advantage of using two experimental animals for every sample. Another question concerns the actual technique. In the present investigation the deposit from 75 c.cm. of milk, centrifuged for 20 minutes at 3000 r.p.m., was emulsified in 5 c.cm. of saline and divided between two guinea-pigs. It may be asked why the test should not be made more sensitive by inoculating each animal with all the deposit from 75 c.cm. of milk; this would not add much to the expense of the test though it would of course increase the labour of centrifugation. Mattick and White do not comment on this point, but there are two obvious objections to the use of large quantities of milk. First, by doubling the strength of the inoculum, the amount of extraneous matter, other than tubercle bacilli, is doubled and the chance of intercurrent infection thus increased; for the observations recorded show that the amount of dirt in the inoculum influences the probability of premature death. Secondly, the problem of transit of samples may make it difficult or even impossible to obtain large quantities of milk. Against these objections must be weighed the undeniable advantage of increasing the concentration of tubercle bacilli by doubling the volume of milk tested. In the present experiments each pair of guinea-pigs was kept in a single cage and out of the 9550 which were inoculated about 10 per cent. died prematurely. This figure, which agrees with those given by other workers, might well be lowered if only one animal was kept in each cage, but the extra attention and accommodation required might neutralise the economy.

It is noteworthy that in Mattick and White's inquiry only 13 per cent. of samples taken from cows suspected, on clinical grounds, of suffering from

tuberculous mastitis proved to be excreting tubercle bacilli in the milk. Superficially this figure reflects upon the value of the routine clinical examination of udders for suspicion of tuberculosis. But it must be remembered that tuberculosis is only one of several common causes of chronic mastitis and the symptoms of tuberculous mastitis are by no means characteristic. In all cases of doubt a sample must be sent in for laboratory examination and this may well account for the low proportion of positive returns.

RECURRENT PAROTID SWELLING

MUCH attention has lately been paid to recurrent swelling of the parotid gland, partly in the hope of elucidating its pathology and partly to show that it differs from epidemic parotitis. The newer methods of investigation, such as sialography, and the examination of catheter specimens of parotid saliva, have thrown some light on the condition, but the various investigators have naturally tended to emphasise different aspects of the problem, and their data are not always comparable.

The diagnosis is used to cover all cases of periodical or recurrent enlargements of the parotid, irrespective of the frequency or duration of the attacks or the underlying lesion. In 19 such cases studied by Payne,¹ no fewer than 16 of the patients were women, the average age at onset being 29, and the average duration of symptoms nine years. As a whole, the group showed nervous instability, and there were wide variations in their attacks. Characteristic changes were found in the saliva, which was always infected (most commonly with *Streptococcus viridans*) and sialography demonstrated equally characteristic changes in the ducts, strongly resembling those of bronchiectasis. Similar cases have been recorded by Pyrah,² and more recently Pearson³ has described a series of 17 cases, 13 of them in children under twelve. This series differs from those previously described not only in age-incidence, but also in the preponderance of males and the rapidity of appearance and disappearance of the swelling in many of the children. Pearson divides his cases into non-infected and infected, but it is not clear whether bacteriological culture of the saliva was carried out in all of them. Sialography in both groups showed changes like those recorded by Payne. In a large proportion of the cases there were associated symptoms attributable to allergy (e.g., asthma, hay-fever, or urticaria), and the saliva of one patient during the attacks contained plugs packed with eosinophils. In this connexion the report of Meyer⁴ of a familial history is interesting; his patient, the mother, and the great grandmother had all suffered from recurrent parotid enlargement.

From the practical point of view, two facts are especially important. The first is that many of the cases are diagnosed and treated as mumps, or as recurrent mumps, though it is doubtful whether there is ever a second attack of mumps. Secondly, it is noteworthy that gross suppuration is rare, although the local condition may be disconcerting, and the immediate prognosis is therefore good. The separation of these cases from recurrent swelling of the parotid due to calculi should not be difficult, but swellings of the same kind have been recorded in toxic conditions such as lead-poisoning or in association with the use of iodine or mercury. Similarly,

¹ Payne, R. T. : THE LANCET, 1933, I., 348.

² Pyrah, L. N. : Brit. Jour. Surg., 1933, xx., 508.

³ Pearson, R. S. B. : Arch. Dis. Childhood, October, 1935, p. 363.

⁴ Meyer, H. S. : Jour. of Pædiat., 1934, iv., 248.

¹ Mattick, A. T. R., and White, P. : Med. Officer, Dec. 28th, 1935, p. 265.

they should be readily differentiated from the occupational enlargements of the parotids seen in glass-blowers and players of wind instruments and occasionally in malingerers, for in these the swellings are pneumatocoeles. For the rest it must be admitted that no uniform explanation is applicable to the groups of cases now being considered. The rapid development of the parotid swellings in early life and their frequent association with allergic symptoms are striking features, as is also the observation that in adults they are associated with emotional instability. As seen on X ray examination the changes in the ducts are alike in children and adults. Whether the primary obstruction is allergic, spasmodic, or catarrhal is uncertain, but once it has developed, it is followed by dilatation and sooner or later by infection. In childhood it may be found that the attacks cease with the elimination of certain articles of food from the diet, with the clearing-up of buccal infection or with simple massage of the parotid gland. In adults the same methods may be successful, but where organic changes are more advanced, slitting and dilatation of the duct, auriculo-temporal avulsion, and X ray treatment may all give better results.

PHYSIOLOGICAL CHANGES DURING PUBERTY

ALTHOUGH much statistical information is available concerning growth in the years of puberty, it is mostly based on the study of large groups of children at different age-periods. Thus it has been shown that about two years before puberty begins there is a slowing in vertical growth, followed by a rapid increase during several subsequent years, girls being taller than boys. The maximum increase in weight occurs slightly later than the maximum increase in height. Of the signs of puberty in girls, breast development is usually the first, and it is followed by rounding of the hips and the appearance of pubic and axillary hair, in that order. As a rule menstruation is the last, or almost the last, sign, becoming established when breast development is nearly complete.

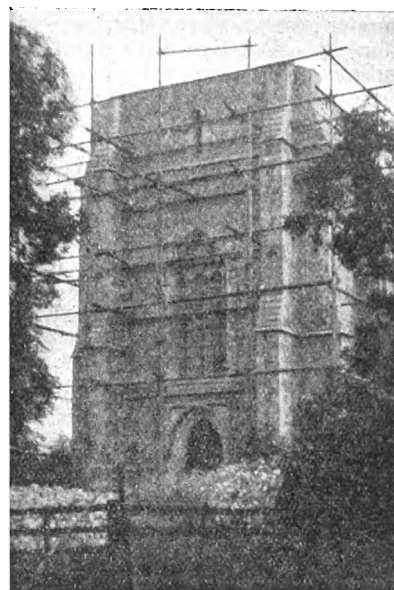
Thinking in terms of the individual rather than the age-group Dr. Gustav Nylin¹ has made an intensive study of 12 girls in the four years during which the onset of puberty might be expected. They were inmates of the State Institute for the Blind at Tomleboda, and were most of them suffering from congenital eye defects, but they were chosen because their physical and psychical status was otherwise as nearly as possible normal. Conditions of examination were standardised. In all but one subject the maximum growth in height was found to correspond with the commencement of puberty, though the age at which this occurred varied considerably (from 9.8 years to 14 years, with an average of 11.8). The duration of this maximum height increase varied from 471 to 884 days, and in most cases breast development was complete when growth ceased. As breast development was found to be the first sign of puberty, there therefore appeared to be a close relationship between breast development and height increase. The thyroid also seemed to increase in size during the same period, but as the means of measuring its growth were not accurate, little emphasis can be laid on this impression. Nylin also found that the height-increase declined when menstruation began. The arteriovenous oxygen difference under standard conditions proved singularly constant during growth, from which he concludes that the blood flow is a

direct function of standard metabolism, since the latter was observed to increase considerably during the period of maximum growth. The pulse-rate fell throughout the period of study, and showed no signs of rising with the onset of puberty; but there was a rise in both systolic and diastolic blood pressure during the period of development. The vital capacity also increased during development, though its increase became manifest later than the other functional changes.

THE WILLIAM HARVEY MEMORIAL

WE wish to impress earnestly upon our readers the situation of the Harvey Memorial Fund instituted some time back with the object of rebuilding the fallen tower of Hempstead Church, Essex. Our readers have been kept informed of this movement and must sincerely

hope with us that it will soon come to a satisfactory conclusion, for the delay has been regretted by many, though strenuous efforts have so far failed to abbreviate it. The present position is that the work of restoration, which so far has been exceedingly well carried out, has proceeded, and about two-thirds of the structure has been restored; but the fund



is now exhausted and progress has ceased. The last third of the work, which includes the rehauling of the bells, remains to be dealt with, and a sum of approximately £2000 is yet required for the termination of the undertaking. Lord Horder has become chairman of the committee in the place of the late Sir John Rose Bradford, and all donations should be made payable to the Harvey Memorial Fund and sent to Dr. G. de Bec Turtle, Royal College of Physicians, Pall Mall East, London, S.W.1.

AN ANTISTREPTOCOCCAL AGENT

INTEREST has lately been aroused by the claims of German workers to have synthesised a chemotherapeutic compound efficient against streptococcal infections. This substance, which has been named Prontosil, when given either subcutaneously or by the mouth, protected mice against a lethal dose of streptococci injected into the peritoneal cavity. Whereas in untreated animals there were enormous numbers of cocci in the peritoneal exudate, in those treated with prontosil the organisms were few and mainly undergoing phagocytosis. The drug has no appreciable bactericidal action in vitro, and the mechanism by which it acts in the body was therefore obscure. At a discussion in London last autumn¹

¹ Physiology of the Circulation during Puberty. Acta Med. Scand., Suppl. lxxix., 1935, p. 77.

¹ THE LANCET, 1935, i., 840.

it emerged that English workers had been able to confirm the original claims only in part; a longer survival in experimentally treated mice was common, but ultimate recovery, so far from being the rule, was rather the exception. This difference was apparently attributable to the properties of the streptococci used, those in the favourable German experiments being derived directly from human sources, whereas in England the strains employed had been submitted to repeated mouse passage, with a consequent increase in virulence for mice. The still more recent findings of C. Levaditi and A. Vaisman,² who used non-passaged strains, indicate a striking therapeutic effect, but one to which there were exceptions in every series of animals; with whatever dosage, either of the drug or of culture, 100 per cent. survival was never obtained. These investigators also report experiments designed to ascertain how the drug acts. On the possibly inadequate ground that reticulo-endothelial "blockage" does not interfere with the therapeutic action of prontosil, they conclude that its effect is not secured by any sort of stimulation of the defence mechanism. On the other hand, they have come to the conclusion that it acts by preventing capsule-formation, and so rendering the streptococcus susceptible to phagocytosis. This plausible idea is supported only by the observation that the drug is ineffective when the inoculum consists of (capsulated) streptococci derived directly from the peritoneal cavity of another mouse. The hypothesis may very well be true, but it perhaps requires verification by other means. Meanwhile the therapeutic utility of this drug needs to be studied further in the clinical field, though the temptation to its indiscriminate employment should be resisted. Levaditi and Vaisman have shown by experiment that prontosil is without influence on a number of other bacterial and virus infections, and the original clinical results reported from Germany indicate that it is of value only in infection by *Streptococcus pyogenes*. Its use should evidently be restricted to cases of this infection.

RECONSTITUTION OF DURHAM UNIVERSITY

THE Commissioners appointed under the University of Durham Act, 1935, have drawn up a first draft of statutes for the reconstitution of Durham University. Under the new constitution the Newcastle College of Medicine and Armstrong College will cease to exist as separate corporations and be merged in University College, Newcastle-upon-Tyne. The council of University College will consist of the principal, the dean of medicine, six and twelve members to be appointed in the first instance by the existing councils of the College of Medicine and of Armstrong College respectively, six members to be appointed by the academic board of University College, four members by the Newcastle City Council, two members by the Northumberland County Council, two members by the house committee of the Royal Victoria Infirmary, one member by the committee of management of Newcastle-upon-Tyne Dental Hospital, two members representative of other associated hospitals, and, if the council so determine, two co-opted members. None of the members appointed by the existing council of the College of Medicine shall be full-time teachers and not more than two shall be part-time teachers in University College. The council will appoint a dean of medicine for a period not exceeding five years who shall be responsible—under the authority of the council, the academic board, and the

principal—for guiding the organisation and development of medical education and research and for maintaining close relations between University College and the associated hospitals. All matters relating to the organisation of medical education and research shall be referred in the first instance to a medical studies committee of the academic board. As soon as possible after the appointed day a temporary Newcastle council will be formed which will forthwith appoint a dean of medicine who shall thereupon become a member of the temporary council in place of the existing dean of the board of the faculty of medicine. As soon as this appointment has been made the temporary council will provisionally determine, without any report from the academic board, what holders of academic posts shall be members of this board. The Commissioners are ready to receive and consider any representations made to them before April 1st, 1936. Such representations should be sent to the secretary to the Commissioners, 3, Sanctuary Buildings, Great Smith-street, London, S.W. 1.

ACTION OF AMYL NITRITE

THE inhalation of amyl nitrite as a treatment for angina pectoris was introduced by Lauder Brunton in 1867. He tried it because he knew that venesection diminished the severity of the attacks of pain and it seemed to him that amyl nitrite, a drug already known to diminish vascular tension, should act similarly. The striking relief which it afforded was related by him to the fall of blood pressure produced by the drug with consequent relief to the heart. This, the most apparent explanation, received almost universal assent and is still held by some clinicians. It is only of recent years that the view has been attacked as inadequate, but the cumulative evidence against it as a complete explanation is now considerable.

Five years ago Lewis,¹ investigating a series of cases of angina pectoris associated with high blood pressure, found that amyl nitrite would often give relief without conspicuous change in the blood pressure, and concluded that the effects of the drug were not to be ascribed to simple lowering of the pressure but were "in part, if not in chief part, due to dilatation of the coronary vessels." Studies on the relationship of blood-pressure changes to the disappearance of pain in angina of effort after the inhalation of amyl nitrite have led to similar conclusions.² That amyl nitrite dilates the coronary vessels in animals is certain; but the fall in systemic blood pressure tends to reduce the flow of blood and this effect might well lead to a reduction in the total blood-flow through the coronary arteries. Actual measurements in the intact animal have given conflicting results, although the balance of evidence is in favour of an increase in the total blood-flow. The importance of further evidence in man is therefore apparent.

It is now widely believed that alterations in the electrocardiogram similar to those seen in coronary thrombosis may occur when there is a relative ischaemia of the cardiac muscle. Nitroglycerin has been shown by Scherf and Schnabel³ to prevent, or diminish the degree of, this alteration in attacks of angina pectoris, and Evans and Hoyle⁴ have demonstrated improvement in abnormal electrocardiograms after amyl nitrite. Nagl⁵ has recently

¹ Lewis, T.: *Heart*, 1931, xv., 305.

² Wayne, E. J., and Laplace, L. B.: *Clin. Sci.*, 1933, i., 103.

³ Scherf, D., and Schnabel, P.: *Klin. Woch.*, 1934, ii., 1397.

⁴ Evans, W., and Hoyle, C.: *THE LANCET*, 1933, i., 1109.

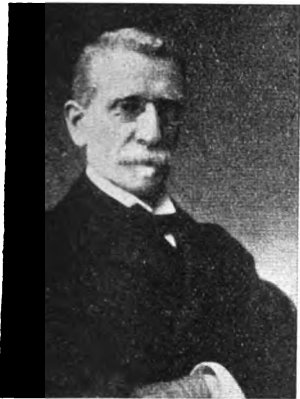
⁵ Nagl, F.: *Wien. klin. Woch.*, 1935, xlviii., 1543.

^{*} *Presse méd.*, Dec. 25th, 1935, p. 2095.

recorded simultaneously the effect of amyl nitrite on the electrocardiogram, arterial and venous blood pressures, and heart-rate of normal persons. Alterations in the T wave of the electrocardiogram were brought about which are interpreted as due to a temporary relative cardiac ischæmia. It is believed that this can be accounted for by the rise in the heart-rate which increases the work of the heart at the same time as the coronary flow is reduced by the fall in blood pressure. Nagl suggests, therefore, that amyl nitrite should not be used in cases of angina pectoris with a tendency to tachycardia. It is known that its inhalation may rarely increase the severity of anginal pain⁶ or even induce an attack,² and changes such as Nagl describes may well be the cause. But in practice it is impossible to foretell which patients will respond well and which badly to amyl nitrite and actual trial in an attack is the only test. It is worth noting that patients who suffer from the relatively mild pain of angina of effort usually prefer to take nitroglycerin, while amyl nitrite is best reserved for the long-lasting "spontaneous" attacks in which it gives the spectacular relief on which its reputation rests.

ETTORE MARCHIAFAVA

THE death of Prof. Marchiafava in Rome has been overshadowed by war, but the passing of so great a figure in international medicine should not be forgotten because he had outlived his contemporaries. Ettore Marchiafava was born in Rome on Jan. 3rd, 1847, and he died there on Oct. 25th, 1935. He took his degree in medicine in 1871, was nominated next year assistant in the university department of pathological anatomy, and succeeded to the chair in 1883 when Tommasi-Crudeli was transferred to the chair of hygiene. During his 40 years as professor of pathological anatomy Marchiafava made many important contributions to medical knowledge. This was a time of renaissance in Italian medicine, in which he bore a distinguished part. He was a great teacher; his lectures on patho-



logical anatomy made the dead live again to his hearers as he recalled the history, the symptoms and physical signs, and summed up their relation to post-mortem findings. But outside Italy Marchiafava's fame is based upon his observations on malaria. As early as 1879 he maintained that melanin was derived from the destruction of the hæmoglobin of the red corpuscles, and he went on to interpret correctly the early stages of development of the malarial parasite. With Celli he demonstrated the development of the parasite in the red corpuscle, the amœboid movement, and the production of melanin. In 1889 he and Bignami discovered the parasite of æstivo-autumnal or subtertian fever, and in 1892 they described the character of the pernicious forms. He was also able to differentiate the quartan from the benign tertian parasite. Marchiafava's interest in pathology never

ceased, and in his ninth decade he was still to be found at work in the Institute of Pathological Anatomy.

RED CELL SEDIMENTATION IN HEART DISEASE

THE value of the erythrocyte sedimentation-rate as an indication of active disease has been demonstrated in rheumatic carditis, and also in syphilitic aortitis, thyrotoxicosis, and hypertensive heart disease. In the January issue of the *Quarterly Journal of Medicine* Paul Wood gives the results of sedimentation tests done on 164 cases of all types of heart disease and heart failure, excluding cases with any form of intercurrent infection or with a secondary anæmia as shown by a red cell count of under 4 million or a hæmoglobin under 70 per cent. As controls he has used 19 patients with cardiac neuroses. He finds that congestive heart failure retards the sedimentation-rate regardless of the cardiac pathology and therefore masks evidence of active disease. Increased sedimentation-rates are found in active rheumatic heart disease, myocardial infarction, and syphilitic aortitis; the result in this last condition may help in the distinction between an aortic valvular disease due to syphilis, rheumatism, or athero-sclerosis. Again, the sedimentation-rate may enable one to distinguish between coronary thrombosis, angina of rest, and angina of effort, since in cases of coronary thrombosis the rate is not immediately increased, but after a day or two increases steadily to a maximum, till about the end of the third week, after which it slowly returns to normal. Angina of effort, on the other hand, shows a normal sedimentation-rate, and angina of rest, in the absence of syphilitic aortitis, gives a slightly to moderately increased rate which does not change materially from week to week.

THE ENDOCRINE ORGANS AND INSANITY

"We believe that it cannot be successfully denied that the *corpus* of present day psychiatric literature conveys, and is intended to convey, the idea that the endocrine pattern is a significant and important causal factor in the etiology of those abnormalities of behavior that are collectively subsumed under the term 'insanity.' But where is there precise *proof*, in the truly scientific sense, that this is so?"

HAVING put this question to themselves, and finding no satisfactory answer, Raymond Pearl, Marjorie Gooch, and Walter Freeman set about the task of seeing whether a statistical study of the weights of the endocrine organs in a group of the insane would provide any information from which conclusions could be drawn. Their study,¹ most carefully and laboriously carried out, deals with 1307 insane persons dying in hospital and examined *post mortem* by Freeman. Each individual was placed, according to the preponderance of clinical evidence, into one of four broad groups—namely, cycloids, paranoids, schizoids, and epileptoids. This material, as the authors point out, has serious limitations; it relates wholly to a mentally diseased population, and standards of comparison from normal persons can be taken only from the very heterogeneous materials available in the literature. Secondly, the progress of the patient to death may well have changed the biologically normal weight relations of the parts. Imperfect as the data are, they should, however, be capable of revealing any pronounced differences between what the authors term the endocrine pattern of the psychiatric disease types.

⁶ Wood, F. C., and Wolferth, C. C.: *Arch. Internal Med.*, 1931, xlvii., 339.

¹ *Human Biology*, 1935, vii., 350 and 555.

In fact the analysis shows no striking or orderly difference in the weights of the various organs in the four groups. If, for instance, aberrations of thyroid structure and function are significant factors in the ætiology of different types of psychoses, this fact is not reflected in any definite manner in the weight of the organ, so far as the present data indicate. On the other hand, the quantitative pattern of the endocrine system as a whole, as indicated by organ weights, does appear to differ between the insane and the most reliable "norms" that the authors have been able to discover. This difference concerns not so much the total mass of all the endocrine organs taken together as a whole, in proportion to body size, but the *pattern* of the system—the proportionate quantitative contribution of the several organs to the total. Judging by this comparison, the insane are deficient relatively in thyroid tissue but over-supplied relatively with parathyroid, thymic, and adrenal tissue. They show only a generally small and probably insignificant relative excess of pituitary and pineal tissue and a small relative deficiency of testicular or ovarian tissue.

The authors with becoming caution conclude, therefore, from their elaborate study that the pattern of the endocrine system as a whole *may* really differ significantly between the mentally diseased and the not-mentally diseased, but to prove this will require more evidence, and evidence of a different character, than they have been able to present. Until that evidence is available they suggest that vague generalisations about the importance of the endocrine glands in insanity are premature.

A CAUSE OF ULCERATIVE COLITIS ?

CHRONIC ulcerative colitis is sometimes regarded as a sequel to bacillary dysentery and sometimes improves under treatment with antidysenteric serum. Bagen attributes it to a specific diplo-streptococcus; others have put forward the claims of certain anaerobic bacteria. None of its "causes," however, has yet been generally accepted and attention must therefore be paid to the evidence put forward by Dack and his fellow-workers¹ in Chicago. Believing that no satisfactory growth of a delicate and deep-seated organism is likely to be obtained in ordinary cultures of fæces—or indeed from scrapings of ulcers seen directly with proctoscope or sigmoidoscope where the contents of the upper bowel are continually pouring over the ulcerated area—they have investigated 3 cases of chronic ulcerative colitis in which symptoms and radiographic and proctoscopic examinations were characteristic of the severe form of the disease, and in which the affected colon had been completely isolated following an end ileostomy. Numerous observations of these cases led to the recovery from the colon of Gram-negative pleomorphic non-sporulating rods extremely sensitive to oxygen and difficult to subculture. The same organism was isolated by appropriate methods from the non-isolated colon in 7 out of 12 additional cases of non-specific chronic ulcerative colitis and in 2 cases of specific (amœbic) ulcerative colitis. Complement-fixing antibodies were found in the serum of 14 out of 16 cases of typical chronic ulcerative colitis, but in only 3 of 16 control patients. In several cases complete fixation was obtained with a serum dilution of 1 in 10. The organism in question seems to resemble very closely the bovine *Bacillus*

necrophorus which produces severe septic processes in a number of domestic animals. This organism may invade any tissue and produces various necrotic foci—e.g., calf-diphtheria, necrotic ulcers of the intestine in hog-cholera, metastatic necrosis of liver and lungs of cattle and swine, and necrotic stomatitis of calves, lambs, and pigs.

MILK BY FOUR DIFFERENT NAMES

FROM April 1st of this year there will be four grades of milk instead of the five on sale at present. The draft Milk (Special Designations) Order, 1936, does not employ exactly the nomenclature forecast in our leading article of July 6th last, but the scheme is substantially the same, with its advantages and disadvantages. In future there will be two grades of fresh milk, called Tuberculin-tested and Accredited; also two grades which have been treated by heat, called Pasteurised and Certified (Pasteurised). The last-mentioned is tuberculin-tested milk which has been pasteurised, and it will therefore be the cleanest and safest of the four grades, having a bacterial content of not more than 30,000 bacteria per c.cm. (compared with 100,000 in pasteurised). The present top grade, Certified, which is bottled on the farm and contains no more than 30,000 organisms, is abolished. Tuberculin-tested and accredited milks will closely resemble the present Grade A (T.T.) and Grade A respectively; but after the end of this year the requirement that they shall contain no more than 200,000 bacteria per c.cm. before delivery to the consumer will be replaced by a methylene-blue reduction test. Everyone will be glad that the name "Grade A" should give way to a more non-committal description, and it is an advantage that the "accredited" herds should be inspected quarterly instead of every six months. But whatever its name, this type of milk cannot—as we said in July—be recommended by the medical profession for consumption in the raw state.

Under the new Order the Ministry of Health will no longer grant licences to producers of tuberculin-tested milks. All the licences will henceforward be issued by local authorities.

OWING to the death of King GEORGE it has been decided not to hold the Hunterian festival dinner of the Royal College of Surgeons on Feb. 14th, but the Hunterian oration will be delivered at 4 P.M. on that day by Mr. C. H. Fagge as arranged. The ball of the St. George's Hospital medical school on Feb. 19th has been cancelled, and the dinner of the Royal Society of Medicine on the same day has been postponed. Prof. Edward Mellanby's lecture, on Jan. 31st to the Royal Institution, on Recent Advances in the Treatment of Disease has also been postponed.

INDEX TO "THE LANCET," Vol. II., 1935

THE Index and Title-page to Vol. II., 1935, which was completed with the issue of Dec. 28th, is now ready. A copy will be sent gratis to subscribers on receipt of a post card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

¹Dack, G. M., Dragstedt, L. R., and Heinz, T. E.: Jour. Amer. Med. Assoc., Jan. 4th, 1936, p. 7.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXXXVI.—PROGNOSIS IN ASTHMA

It is generally held that asthma does not appear unless there is a hereditary predisposition, and as this predisposition is inherent and permanent it is impossible to speak of a cure for asthma. On the other hand, we have reason to believe from the study of pedigrees and from the results of skin tests on apparently normal individuals that the asthmatic tendency may remain latent throughout life, and we know that many patients lose their asthma for long periods of time.

Little is known about the factors which determine the latency or manifestation of asthma. Some physicians of experience do not share the prevalent enthusiasm over modern methods of treatment, and believe that we are no better able to control the disease than were physicians of a generation ago, though we are better equipped than they to relieve its symptoms. Asthma is a variable illness, and while we must often sympathise with the patient in his relapses, we can also congratulate him on his remissions. It is understandable that these remissions should be attributed to the treatment, rather than to that waywardness of the disease which we consider responsible for the relapses, and every therapeutic novelty is for a time regarded as a cure for asthma—vaccines, endocrines, allergens, X rays and irradiation, ketogenic diet, gold, liver, artificial fever, and sympathectomy. Attacks of asthma, like attacks of peptic ulceration or acute rheumatism, tend to recover spontaneously, and of patients seeking medical advice for asthma some 50 per cent. may be expected to improve without specific treatment. With few exceptions no treatment precludes the likelihood of relapse in a few months or years, and though it is possible to distinguish those who are likely to do well from those who are likely to do badly, it is rarely wise to predict complete cessation of the paroxysms. For all this, I believe that the outlook for the asthmatic patient to-day is better than it was thirty years ago.

In what follows I shall assume the orthodox treatment of asthma. The paroxysms are relieved by antispasmodics such as adrenaline and ephedrine. Between the attacks attention is paid to the hygiene of life, the avoidance of overloading of the stomach or colon, the minimisation of contact with animal and vegetable dusts. Psychological stimuli are removed and respiratory exercises are carried out regularly. Septic foci and nasal abnormalities are treated with the utmost conservatism. When there is bronchitis an autogenous vaccine from the sputum is used, and if the patient is clearly sensitive to common inhalants such as pollen or orris root the attempt is made to desensitise him.

The questions that arise in prognosis are (a) risk of death in a paroxysm; (b) prospect of immediate improvement; (c) prospect of permanent recovery; (d) effect of the disease on the general health and duration of life.

Death in or following a Paroxysm.—It is sometimes suggested that asthma is more annoying than dangerous, and that it has little influence on the duration of life. It is true that death during a paroxysm is unusual. It is nevertheless not so unusual as is taught, and whenever a patient passes into the status asthmaticus or has persistent dyspnoea for more than one or

two days the risk of sudden death should be seriously considered. Experience of a large clinic at which several hundred patients are in regular attendance suggests that one or two of these patients may be expected to die of asthma every year. Death may result from the immediate effects of the paroxysm, from heart failure, or from pneumonia. I believe that pneumonia is usually initiated by patchy or more massive collapse of the lungs induced by excessive secretion of mucus and bronchospasm, and it may be followed by pleurisy and empyema. A rarer sequel of the paroxysm is spontaneous pneumothorax, which is usually more alarming than dangerous. I have also seen cerebral hæmorrhage in a young woman.

Prospects of Immediate Improvement.—With modern treatment about 20 per cent. of patients are completely relieved of their asthma for some years; between 15 and 20 per cent. are absolutely resistant to treatment, while the remainder are more or less improved though still subject to attacks. In other words, between 66 and 75 per cent. of cases are significantly improved. Failure to improve may be due to incomplete investigation and treatment, or to ignorance and lack of coöperation on the part of the patient. The patient may know the cause of his asthma but is unable to avoid it and desensitisation proves unsuccessful. The ability to spend one's childhood at a public school on the south coast rather than in an overcrowded tenement in Hoxton, to winter in Switzerland, or to undergo a long and expensive course of desensitisation, is naturally an important element in prognosis. Favourable features are early age of the patient, brief duration of the asthma, and infrequent attacks. The popular belief that children "grow out" of asthma probably exaggerates the frequency of spontaneous recovery and should not be allowed to encourage neglect of treatment. A seasonal incidence and sensitisation to a single inhalant such as pollen, to which the patient can be specifically desensitised, are of good prognostic omen. Allergic complications such as hay-fever, rhinorrhœa, eczema, and migraine are of no moment, and, indeed, in so far as they stress the importance of protein hypersensitiveness, are of good augury. Nasal disease, respiratory complications (such as bronchitis, emphysema, and pulmonary fibrosis), and hyperpiesia mitigate strongly against lasting improvement. The chronic nasal patient, shorn of turbinates, wheezing and whistling through his antrostomies, is as big a bugbear to the physician as is the chronic abdominal patient, and he is as little amenable to treatment. As already indicated, the chances of improvement are inversely proportional to the age, and while the duration of the asthma is less significant than the age of the patient, it is unusual for a patient who has had asthma for more than 20 years to gain real freedom from the disease.

The Prospect of Permanent Recovery.—What happens to patients who are for a time completely relieved of their asthma? Unfortunately many of them relapse, and within five years nearly half of them are having asthma again. It is probable that the longer the remission the smaller the likelihood of relapse, but it is quite common for patients to relapse after being free for ten or more years. Remissions of this kind occur most frequently between the ages of 15 and 30,

and it is not unusual for adults coming for treatment to give a history of asthma in childhood which disappeared at puberty and has only reappeared after many years. In such cases it is usually a new and different stimulus which is evoking the asthma—in Rackemann's simile the gun remains loaded and a new trigger is firing the attack. Once more improvement should follow appropriate treatment, an improvement which in chastened mood we shall now describe as relief rather than cure.

Effect of Disease on General Health and Duration of Life.—The risk to life is greater in patients over 40, more especially when the asthma did not develop till adult life; in those whose attacks are frequent and difficult to relieve by symptomatic remedies; and in cases accompanied by atheroma, hyperpiesia, or emphysema. The family history is more often negative and protein hypersensitiveness is more often absent in fatal cases than in the average asthmatic. On the other hand, extreme protein hypersensitiveness is not unduly dangerous except in so far as acute anaphylaxis may result from the parenteral introduction of the protein in skin testing or in attempted desensitisation. In patients under 40 with mild and occasional asthma the mortality is probably not more than 25 per cent. above the standard figures. In patients over 40 with frequent and severe paroxysms the mortality is two or three

times the standard value, the excess of deaths being due to heart disease and pneumonia.

Apart from respiratory and cardiovascular complications asthmatics are a healthy race, perhaps less liable than their fellows to infectious illnesses. They are bad subjects for operation or for acute respiratory disease, but have the compensation that an operation or a febrile illness is often followed by a relatively long period of freedom from asthma. The distress induced by a hearty meal induces many of them to maintain their nutrition at a subnormal level, but this doubtless has its advantages as well as its drawbacks. They are intelligent and courageous, and while psychological factors play an important part in their illness it is unwise to regard an asthmatic as neurotic in the derogatory sense or he will confute you by dying in an attack. If the physician cannot cure the malady the patient can nevertheless learn to manage it and live with it, and he should be encouraged to live as full a life as possible. Occupations which entail arduous physical exertion or exposure to dust are unsuitable, but with these exceptions the asthmatic should be encouraged to look forward to a career on an equal footing with his fellows.

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SPECIAL ARTICLES

MENTAL HEALTH

TROUBLES OF ADULTS AND CHILDREN

THE fourth biennial conference of the National Council for Mental Hygiene was held at the Central Hall, Westminster, from Jan. 23rd to 25th. At the opening session the chair was taken by Mr. W. F. Roch, vice-president, and a discussion on Mental Hygiene and International Relations was opened by Lord ALLEN of HURTWOOD, who said he believed that the psychological factor would increasingly determine the question of war or peace. Almost for the first time in history the exercise of imaginative will-power could now give the victory to peace, notwithstanding the causes of war that still remained. There was now no physical reason why anyone in any part of the world should be hungry, ill-clad, or ill-housed, or why nations should fight for their livelihood. There was now a mechanism, in the League of Nations, whereby men could make effective over the world of nature that mastery which science had placed in their hands. Men's minds, however, seemed to be still inadequate and the problem was one deserving the consideration of those interested in mental hygiene. Mental adjustment and control were essential to counterbalance the accumulated fund of tradition and behaviour which caused every nation to work off its unsocial passions on its neighbours. The evils of the Treaty of Versailles might have been due very largely to life in an ill-ventilated nursery ruled over by a tired nurse and visited by a preoccupied father and a too-loving mother. The citizen must cease to make his children in his own image. Dr. WILLIAM BROWN read the paper published on p. 290, and a brief discussion followed.

At the first session on Friday morning the chair was taken by Dr. Arthur MacNalty, and the subject of discussion was the Organisation and Correlation of Mental Health Services in Local Areas. The

opening speakers were Prof. R. M. F. Picken, Miss Evelyn Fox, and Dr. T. S. Good. In the afternoon, under the chairmanship of Mrs. E. M. Hubback, Dr. Helen Boyle, Mrs. Neville Rolfe, and Mr. Claud Mullins opened a discussion on Problems of Marriage and the Establishment of Courts of Domestic Relations. Eloquent appeals were made by magistrates and doctors alike for the establishment of special courts, imbued with the atmosphere of the consulting-room, to try to prevent the breaking-up of marriages which might be saved by modern psychological methods and the application of sympathy and common sense. Several speakers also urged extension of the divorce law for cases where there was no possibility of successful treatment.

In the evening the Bishop of Southwark took the chair, and a discussion on the Priest and the Doctor in the Treatment of Nervous and Mental Disorders was opened by Dr. H. CRICHTON-MILLER. Nervous and mental disorders, he said, did not arise from simple causes, and it was in the field of multiple causation that the coöperation of priest and doctor was most often justified. It was essential to guard against the facile acceptance of a single explanation which, more than anything, led to partial and ineffective treatment. The adjustment of a personality to, for example, a persistent neuralgic pain should be the concern both of doctor and priest. The three great sources of maladjustment were fear, guilt, and inferiority, and in each of these, and particularly in the second, the priest had a part to play. The problem for discussion was: "How far does equanimity count in promoting and maintaining health, and what measure of equanimity can be secured by the representative of organised religion?" Just as science was broader than the practice of medicine, so religion was broader than the function of the priest.

Canon T. W. PYM expressed the difficulty of the priest who was certain that his penitent was nervously ill when the general practitioner called it overwork

or indigestion and dismissed the matter. The temptation to unprofessional psychiatry was very great. Even when the patient was put in the hands of the right doctor the priest's business was by no means over. For the rebuilding of the religious section of the mind after the psycho-analytic breaking-down the religious expert was needed. Probably very much could be done by ministers of religion to prevent the onset of a nervous or mental disease if only the clergy could obtain some reliable instruction.

Mr. Z. F. WILLIS regretted a tendency to water down Christian essentials in order to establish a respectable concordat with science. He outlined the contributions which the priest could make to psychotherapy, emphasising his value in convalescence.

On Saturday the subject of the three sessions was

Education for Living

In the morning the period before the age of eight was discussed, in the afternoon that from eight to fourteen, and in the evening that from fourteen onwards. The chair at the first session was taken by the Rev. A. W. Harrison.

THE NURSERY

Dr. R. G. GORDON outlined the problems of the infant, and the seeds that might be sown in the early months of life. The relationship of the child to the parents should be an equilateral triangle; divided loyalties were reflected in the growing child by a sense of bewilderment or an attempt to play off one parent against the other. Recent work had thrown a good deal of light on eidetic imagery: an imagery so vivid that it could not be distinguished from reality. About 50 per cent. of children experienced it, but it always faded soon after puberty. A child might be accused of lying when he was really merely describing such images, and if they were really alarming they might have a serious effect on the child's development. Frightening experiences, whether real or imaginary, produced a feeling of insecurity in respect of his environment, while sexual experiences or images produced a sense of guilt or insecurity.

Dr. MARIA MONTESSORI described the process of the child's growth and said that all living creatures in the early stages went through sensitive periods. The young caterpillar found the tender shoots at the tip of the branch as the result of his extreme sensitivity to light, and lost that sensitivity as soon as he was capable of absorbing other nourishment. By means of temporary sensibility of this kind each characteristic was fixed and stabilised. The child's purpose was totally different from that of the adult. He did not scrub a table to get it clean but to scrub until he had mastered scrubbing. The child who had been thwarted in one of his sensitive periods had lost for ever that particular chance of natural growth. Such thwarting might provoke violent reactions with no apparent cause. It was therefore essential to investigate the causes of naughtiness and capricious behaviour. The adult knew the child as he was in disease but had no knowledge of the healthy child because, like all other undiscovered forces of the universe, he was outside the adult's experience.

Miss J. A. CALLARD (vice-chairman, Welsh committee, National Union of Teachers) said there was no reason why the nursery and infant stages should not be regarded as a whole, and the primary consideration at this period was the incessant care for the physical well-being of the child, and regard for the cultivation of desirable habit and deportment. The more formal aspects of instruction would not be

emphasised, but continuous progress would be made in knowledge and expression by methods which invoked in aid of education the pleasurable activities natural to children. As a result of modern training, teachers were both qualified and anxious to undertake this work. There was a crying need for more and better provision for the younger children of this country. The pre-school child had suffered hitherto an avoidable neglect. The open-air principle was particularly desirable for the younger children, and a garden was invaluable. Miss Callard pleaded for the use of the opportunities already available; hundreds of classrooms in infant schools were unoccupied, and their adaptation would be less costly than building nursery schools. There was no reason for the creation of a gulf between schools for those under five and for those over five, and the amenities of a nursery school should be accessible after that age. Regular and nutritious meals were essential, as were also training in hygiene and cleanliness, and provision of bathing facilities and stretcher beds for the afternoon rest. There was a need for unification of administrative control.

In the afternoon the chair was taken by Dr. J. A. Glover, and Dr. EMANUEL MILLER spoke on

MOULDING THE MIND: EIGHT TO FOURTEEN

He looked with suspicion, he said, on any efforts to mould the mind, for the phrase implied preconceived ideas as to shape and a ready-made design for living. The major conflicts of life were faced and dealt with in the first five years, neurosis and character formation being the resultants; intelligence alone remained to develop. The ability to exercise curiosity, to make emotional contacts with schoolmates and teachers, depended on the degree of emotional freedom left after the years of early struggle. Before teachers set to work on the child between eight and fourteen they ought to be provided with such knowledge of his childhood as was put into the hands of physicians by the social worker of a child guidance clinic. It must be ascertained whether the child was tenderly mother-fixed or terrified by parental authority; whether he had latent anxiety or an obsessional disposition. The attempt to mould the mind must be made with knowledge of the material presented. The intellectual capacity and character must be studied and estimated. Special handling would be called for if there were lack of capacity to play in group games, inability to ask questions or excessive questioning, lack of curiosity about manual operations, excessive "goodness," indifference and shyness in social contacts, attitudes of renunciation, or repeated physical incapacity with trivial physical signs or absence of organic disease. Moulding should be designed to remove anxiety or obsession by active treatment, to obviate frustration by love, to afford outlets for aggression in the play group, to condone vulgarity, to organise the "gang spirit" by suitable group activities, to accept sympathetically the tendency to inverted sex interests by preparing for heterosexual enlightenment at puberty, to correct physical anomalies before puberty, and to cultivate manual and artistic aptitudes.

Miss M. WITHERS (headmistress, Dawson Junior Girls' School, Barking) said that nowadays children were not educated for their work but for their leisure. If they were to get the most out of life every side of their nature must have an opportunity to develop; there must be an inner harmony and balance not easily upset by the buffets of life. The school must see that each child was given ample opportunity for

self-expression. This, with the younger ones, came most naturally through painting, acting and rhythmic movement, but if these were to be continued successfully with older girls there must be a carefully planned progressive scheme. The objects of education could be helpfully discussed with nine- to ten-year-olds. Coöperation between home and school was very important, as parents were apt to be concerned primarily with the means of securing a job. When the early forms of self-expression ceased to interest, some kind of craft work was most likely to appeal. Nature study and elementary science were always attractive, and children took infinite delight in growing plants, animals, and the vagaries of the weather. The humanities were the most important of all subjects. Literature gave immense pleasure to children. Children should leave school with the belief that they were entering on a great heritage and that the infinite resources of knowledge were only waiting to be explored.

Miss F. HAWTREY (principal, Avery Hill Training College) said that her students were taught to aim at directing activities rather than at moulding the mind. It was easier to change theory than practice. Modern theory was enlightened, but the average class still contained 40-60 children, wedged in heavy dual desks between high windows, and formative experiences were almost impossible to attain. The child owned nothing but his own copybook; the figures he modelled must return to the common lump, and the well-thumbed text-books must go back to the school cupboard. Schoolrooms were dark and stuffy, and cold water alone ran into the small stained basins. The asphalt playground was as hideous as a prison yard. Moreover, there were still many teachers who had learned in a hard school and felt that they must teach in a hard school. Amidst these surroundings "education for living" must be practised. One of the most serious and insidious threats to freedom arose from the scholarship examination. A little girl of 5½ was said to have observed, "I shall have to get a move on; I have only 4½ more years to get my scholarship." Yet many thousands of teachers were now giving their lives to put the new theories into practice. Bare classrooms were filled with flowers. Flower-beds were made in playgrounds with soil and manure brought in paper bags. Opportunities were found for music, dancing, dramatic work, and painting. The Hadow recommendations would not become effective until suitable schools were provided; the reform of school buildings was an urgent question for education. Schools ought to be beautiful. Prof. Burt had said that the ideal school should be a wilderness playground with a shelter somewhere in it. Nowadays a child's natural exclamation on seeing a gull was, "Look, Mummy, it flies like an aeroplane!" The sum of one penny a day per child would be enough to ensure the future and enable the young "to draw good into themselves from all their surroundings."

THE FINISHED PRODUCT

The evening discussion on the adolescent was conducted under the chairmanship of Mr. Basil Yeaxlee. Mr. R. E. ROPER said that the educational ladder at this age was supposed to lead to higher things, but the trouble about a ladder was that so few people could use it at one time. The post-war increase which had filled the schools was now swelling the ranks of young labour. Into this mad medley were thrown those who had completed secondary school or university courses, slaving for a certificate or degree which would give a better chance of

employment. The anxiety and competition inseparable from adult life to-day cast their shadows over the 8-14 group with a ruinous pre-selection from which infant schools were not wholly free. There was an increase in young adult tuberculosis and a rise also in the number of those certified as mentally defective, and in suicides and attempted suicides. The present chaos could be reduced to some order by raising the school-leaving age, with maintenance where necessary, by extending continued education and by improving school premises. The size of the classes must be reduced and education must be thought of in terms of the individual. All examinations before the last year should be abolished, and even this one should be combined with records of school life as a whole. Above all, anxiety must be removed from education. "Finished" too often meant "done for"; the educationist must see that it meant "perfect," so far as age permitted.

Miss G. HADOW (principal of the Society of Oxford Home-Students) declared that most of the girls who came to her from secondary schools were healthy minded and wholesome, but the exception always attracted the greater interest. There was no doubt that some girls felt the responsibility of being a prefect as something that was a strain, and reacted from it during their first year at college. A break between school and university would nearly always be beneficial, as for many people the change was too abrupt. This especially applied to day-girls, who were often miserably homesick when they first went to college. The difficulties in the way of this break were the loss to the school of a girl at a time when she was most useful, and the necessity of the scholarship. It would be a very good thing if the idea could be disposed of that university education was a mark of special distinction at which every intelligent girl should aim. The present tendency was to judge the worth of a school by the number of girls it sent to a university, and girls who were not really suitable were pushed into college life. Very few entrance candidates showed much evidence of thinking for themselves, and the general attack on and defence of all kinds of opinions encountered at the university were often a shock. One of the weaknesses in school training was lack of precision in thought and expression; there was no evidence of the present generation thinking more clearly or accurately than the last. Its interests, however, were world-wide, and the tone of Oxford was one of conscious responsibility as citizens. Young Oxford passionately desired to be just. The present generation had got over the tendency of the immediate post-war group to kick against every kind of restriction. Like every generation, they wanted experiment and adventure, but their sense of justice and citizenship stood out conspicuously.

Mr. G. A. LYWARD (director, The Clinic and School, Finchden Manor School, Tenterden) said that he proposed to speak about honesty but to call it teachability. He quoted a question presented to him recently by a group of 20 neurotic adolescents after a discussion on coöperation. "Doesn't it look," they said, "as if clear thinking is feeling?" There were two kinds of stealing in adult life: the open and direct, or the indirect dishonest way of, for example, telegraphist's cramp. Both types of thieving were apt to end in confinement: though one place of detention was called a prison and the other was not, both were but external indications of an already imprisoned condition. All of us started life in a prison of some kind, and those who had the care of us

from 0 to 14 helped us to pay off the original debt and enabled us to live like the kings of old, "of his own." Those who were neglected or indulged and so robbed of this capacity remained credit-seekers. They were not the joy-finders, for joy was born of pleasure and pain, success and failure. It did not come to those who lived to please mother. An adult might be defined as a person that had at last grown able to rely upon himself as teachable. The physically grown-up who were not adults in this sense were still fundamentalists and never clear thinkers. The unteachable group included those who were already neurotic at 14. They held on tenaciously to a variety of ideas and ideals which were dangerously different from what they could afford to feel about the same issues. They did not feel personally at all, having as it were numbed themselves against the pain of loss and failure. They were easy prey to the too good and the too bad around them.

The aim of the educationist must be to render teachable, to wean the babe from his delinquency, waywardness, or indebtedness, so that he could concentrate and consecrate body and mind to an ordered life and service which were increasingly free. From 14 onwards was the time when it was necessary to do what the baby could not do: to make distinctions. The whole question involved in differences had to be faced. Before 14 it was comparatively easy to shut one's eyes to differences. At 14 the thinking apparatus might work in either of two opposite ways: it could clarify or confuse and camouflage. It was a shame that the world so often fell to pieces for the child of 14. It would be a sign of grace if the public schools would open their eyes to the fact that a system in many ways desirable for the 14-year-old was not suited to the hundreds who went to public schools still at an emotional age of 3. The number of such would be considerably reduced if more preparatory schoolmasters would appreciate the value of real chaos plus security. Thousands of 14-year-olds were not at public schools but were leaving State schools for all kinds of occupations. At that age they were not so much teachable as suggestible, and when they could not stomach what they met they might either identify themselves with it so that they lost their play and became industrial personalities, or let themselves become machines in work and compensate by an equally mechanical pleasure-world.

All education should be organised with an eye to the danger and ease with which escape from life could be made. There should be more bureaux where adolescents could be saved if possible from drifting into jobs on motives which could not long remain adequate. Ways of escape from growing up might be found in all sorts of culture and even in the scholarship system. Curing was not so effective when the healer did not relate the child's emotional problems to his classroom difficulties, and the true task of the teacher everywhere was to discover the child through his classroom difficulties and vice versa. There were still many teachers as blind as their pupils to the fact that all subjects and all work revealed mind at its creative task of carrying life from the vine to the branches. The unphilosophical teacher was a dangerous teacher, afraid to teach to the feeling because he himself confused "feeling" with "feelings." Children must be so taught that they would expect to find differences within sameness, for in that lay their hope of ultimately finding a unity in the differences. Only such a person was truly honest, truly loving, truly human, and teachable.

MEDICINE AND THE LAW

Respite of Death Sentence after Medical Inquiry

REFERENCE was made under this heading last week to the case of *R. v. Mortimer*, the man who was found guilty of murder in that he had deliberately driven a motor-car so as to run down a woman on her bicycle. There had been a question of the admissibility of evidence of his having similarly driven a car at other women both before and after this particular occasion. The comment was ventured that the defence, having relied on disputing the identity of the motorist, had been debarred from raising the question of insanity. The case established conduct so abnormal that it seemed inevitable that the Home Office would intervene before execution of the sentence.

Hardly had this comment been made before it was officially announced that the Home Secretary, acting under Section 2 of the Criminal Lunatics Act, 1884, had caused a medical inquiry into Mortimer's state of mind, and, after considering the medical experts' report, had recommended the respite of the capital sentence. Thus Mortimer's punishment is nominally commuted to penal servitude for life, and he goes to a convict prison where he will be kept under medical observation. We see therefore how narrow the scope of a criminal trial must necessarily be. Mortimer's conduct was that of a madman, but the issue of his mental state (which must have been the dominant question for the average spectator at the trial) was excluded. In other words, the case illustrates the two different standards which the community applies at different stages of the administration of justice. To the judge and the jury at Winchester assizes, and to the Court of Criminal Appeal, Mortimer was 100 per cent. sane and was fit to be hanged; to the authority which carries out his sentence Mortimer was partially insane and unfit for the death penalty. Naturally the assize court was concerned with his mental state at the date of the offence, whereas the Home Office was concerned with it at the date of the medical examination after the trial; but it will probably not be asserted that Mortimer suddenly changed from sanity to insanity between the two dates. The difference of standard is clear. The criminal court would be concerned with the question whether the prisoner, at the time of the offence, was insane within the limits of the doctrine of criminal responsibility as laid down by the courts. The Home Office is concerned with the question of his insanity under the ordinary law whereby a man can be certified and removed to an asylum. The distinction was brought out by the Home Secretary in the House of Commons after Ronald True's case (Commons Debates, June, 1922, p. 210), and was carefully examined by the Atkin Committee on Insanity and Crime (see the report, Cmd. 2005, published in 1923); possible change in the law and practice of cases falling within Section 2 (4) of the Criminal Lunatics Act, 1884, was one of the questions specifically referred to the committee. There is an ancient legal repugnance to the execution of an insane criminal. Sir Edward Coke, for instance, observed that such a course would be "a miserable spectacle, both against law and of extreme inhumanity and cruelty, and can be no example to others." The repugnance is due to the two ideas that a man of unsound mind is barred from submitting some possible point in stay of execution, and that it is not Christian charity to send him into another world

when he is not of capacity to fit himself to meet his Maker.

Use of Inquest Depositions in Criminal Court

When a man and woman were charged, at Clerkenwell Police-court last week, with the murder of a woman who died after an alleged illegal operation, the prosecution put in the depositions taken at the inquest. Counsel for the male defendant objected, on the ground that, though the man had been called upon to give evidence on three occasions before the coroner, he had never been cautioned that what he said might be used in evidence against him. Counsel suggested that the accused had been severely cross-examined at the inquest which had in effect developed into an inquiry whether the witness had not been an accessory to the alleged illegal operation. Asked by the magistrate if he asserted that the inquest had been improperly conducted, counsel replied that he did not go quite so far, but he did complain that something not proper was done. The prosecution contended that it had been clearly laid down that the question of being cautioned was a point to be taken by the witness and was not for the coroner. This was possibly a reference to a case in which THE LANCET has a special interest, *Wakley v. Cooke*, where the judges supported the view that people should be allowed to make any statement they desire at an inquest and, while not bound to incriminate themselves, must look after their own interests in giving evidence. The prosecution at the Clerkenwell Police-court further referred to a dictum of Mr. Justice Swift that cases of alleged illegal operation would never be brought into court at all if witnesses were cautioned. The magistrate allowed the inquest depositions to be admitted. This course seems clear in view of Section 5 (3) of the Coroners Act, 1887, though doubts have arisen in the past over admitting a witness's deposition taken before a coroner where the accused was not present at the inquest.

Inquest on Death in Nottingham Nursing-home

The Nottingham inquest on Miss Ada Louisa Baguley, a cripple aged 50, who died in an unregistered nursing-home carried on by Nurse Waddingham and Mr. R. J. Sullivan, stands adjourned in view of the ill-health of an important witness. Pending its completion, it is not possible to comment on the important elements of the case and the light it throws on the safety of the system of certification before cremation. Reference may however be made to a point taken by the legal representatives of the proprietors of the nursing-home. Mr. William Smith, on their behalf, drew attention on Jan. 21st to the fact that the coroner had stated that Dr. Roche Lynch, the Home Office analyst, would be called at a later stage. Dr. Roche Lynch had already given evidence, and Mr. Smith expressed the fear that the calling of Dr. Roche Lynch a second time might have the effect of completely shattering any point which might have been made in favour of his clients. He considered he ought to have the assistance of an analyst of equal standing, if that were possible. The coroner replied that Dr. Roche Lynch was not in opposition to Mr. Smith or his client, but was present to help them all in the case.

The incident aptly illustrates the problem inherent in inquest procedure. It is the coroner's inquiry, held in the public interest. To him it is an investigation. On the other hand, to parties or witnesses possibly involved, the inquest, as it develops, may assume the nature of a trial. The coroner naturally wants all the help he can get, and will call and recall

witnesses in his own discretion for that purpose. The legal representative of an interested party may seek to shut out evidence or may press for the principles of a criminal trial where there comes a stage when the case for the prosecution is definitely closed. While all coroners will wish to observe the rules of fair play on which British criminal procedure is based, it is certainly impossible to coördinate inquest procedure with that of assize courts where a specific person is accused of a specific offence. So long as the coroner's court continues, he must have a discretion to conduct the proceedings in his own way.

PARIS

(FROM OUR OWN CORRESPONDENT)

FRENCH DENATALITY

THE decline of the birth-rate has for many years been a popular theme for French Jeremiahs, the latest of whom is Dr. L. Devraigne who, in a communication to the Academy of Medicine on Christmas Eve, entertained his audience with certain lugubrious statistics. In 1868 there were 1,034,000 births, whereas in 1934 there were only 667,000, of which 50,000 were in the families of foreigners. Between 1868 and 1934 the population of France has risen only from 38 to 41 millions. Even in the brief interval between 1932 and 1934 there has been a decline of 45,000 in the birth-rate, whereas in Germany in the first quarter of 1935 there were 47,000 more births than in the corresponding quarter in 1934. In the four years 1930-34 the number of marriages was reduced by 44,000 to 298,000, a decline so prodigious that Dr. Devraigne is surely justified in commenting on it with an exclamation mark. It is true that infant welfare work is much more effective now than it was forty years ago, when 150,000-180,000 infants died every year, and in 1934 there were only 47,000 deaths during the first year of life. But even if, as Dr. Devraigne believes, this figure can be further reduced, the denatality of France will not have been successfully combated. If the country is not to become one vast infirmary for old folk, there must be an average of three children per family, and even this modest standard can only be attained, he thinks, by generously subsidising large families from public funds.

THE FAMILY DOCTOR OF THE FUTURE

A correspondent of *Concours Médical*, who signs himself Briau, draws a modest but quite attractive picture of the family doctor of the future. The family doctor of to-day has died a more or less natural death, the cause of which is specialisation. Perhaps this is just as well for, according to Briau, he had fallen from that high estate enjoyed by the contemporaries of Balzac. In those days the practice of medicine was an art; now it is supposed to be a science. The transition from one to the other has left the family doctor in the lurch; losing the art of his predecessors, he has not compensated for this loss by acquiring the science of his contemporaries, the specialists. Having recorded his death with the causes thereof, Briau proceeds to model from the corpse a new family doctor, less resplendent but more useful. He must not expect great emoluments or great honours, but the modesty of his income and station in life is to be compensated for by the feeling that he fits into the picture. His education is to be general and thorough, essentially practical and

unembarrassed by post-graduate courses in special subjects which divert his attention from his primary function. Like a station-master, he is to control and supervise rather than to lay his own hands on any task requiring great technical skill. He is to be responsible for prenatal and postnatal infant welfare, but the confinement itself is to be in the hands of the specialist that he has advised the family to summon. As the child grows older and the parents are tempted to offer themselves the luxury of an imperious (sic) English nurse, he must not let himself

be ousted, and he must remember that what may be good for little Anglo-Saxon children born in the fog of their cold and wet country is not necessarily just what Latin or Celtic babies need. He will prevent scolioses, dystrophies, and the rest by shunting the incipient patient off to an appropriate specialist. Though he must not specialise, the future family doctor must read medical periodicals and attend medical meetings in order to keep abreast of the times and to distinguish between the specialists to avoid and those to consult.

PANEL AND CONTRACT PRACTICE

Temporary Residents

THE London local medical and panel committee recently suggested to the insurance committee that the distribution scheme should be amended so as to provide that in respect of temporary residents in convalescent homes or similar institutions credits shall be given only in those cases in which a continuation card is submitted containing evidence that medical treatment (which should not include an examination for the purposes of the home) has been given. The subcommittee of the insurance committee expressed the opinion that the proposal was worthy of adoption if made applicable to all temporary residents and the panel committee has now decided to vary its proposal accordingly.

Another Case for Clause 7 (2)

Two insurance doctors have just had to appear before the London medical service subcommittee simply because, according to the facts found by the subcommittee, they had handled a case in their own way instead of acting in accordance with the terms of service. A girl, aged 16½ years, became ill and went with her mother to the surgery of the senior partner, receiving treatment for which a fee was demanded. According to her statement to the subcommittee, the mother demurred, pointing out that, although her daughter had not received a medical card, she was in fact insured. The doctor said she should pay and then apply to the committee for a refund, but no fee was actually paid as the doctor had not the necessary change. Next day the junior partner visited the girl at home, and a similar conversation ensued but no fee was paid on this occasion either. A third consultation took place two days later but on this occasion no reference was made to insurance. An account was rendered and was paid, the junior partner telling the mother that she should apply to the committee for reimbursement. The senior partner told the committee that he had no recollection of anything being said about the patient being insured, while the junior partner was positive that nothing was said when he saw the girl. The mother, on the other hand—she is an insured person on the list of the junior partner—was equally positive that both the doctors were made aware of the position and in fact that her application for reimbursement was made at the suggestion of the junior partner. At the conclusion of the hearing both doctors agreed that there had probably been a misunderstanding and they expressed their willingness for the case to be dealt with as though they had issued form G.P.4. The committee found that there had been a failure on the part of the junior partner to comply with the terms of service, but in view of his offer to refund the amount

charged, decided to take no further action in the matter. And all this trouble might have been saved if the practitioners had followed the procedure laid down for their protection in Clause 7 (2) of their Terms of Service.

The Chemist who was Annoyed

A test prescription for Mist. gent. acid. was recently presented to a certain chemist, and in due course the medicine was analysed. The analysts stated that in addition to a trace of hydrochloric acid and possibly a small proportion of infusion of gentian (there should have been 200 and 300 minims respectively) the sample contained hydrobromic acid equivalent to 146.8 minims of acid. hydrobrom. dil., and alkaloids of nux vomica equivalent to approximately 16 minims of extr. nuc. vom. liq. or 190 minims of tinct. nuc. vom. in the 10.65 fluid ounces dispensed. The chemist was invited to explain the discrepancy, but the only remarks offered by him were that "whatever concoction the analyst has been analysing it has nothing whatever to do with the mixture that I dispensed and supplied." In further letters he attacked the staff of the insurance committee, and when writing to say that he did not propose to attend the hearing by the pharmaceutical service subcommittee, he made the somewhat naïve suggestion that it would be remarkable if he could compound Mist. gent. acid. without getting any of the ingredients into the bottle. But he did not take the precaution of having the second half of the mixture analysed by an independent analyst and has only himself to thank that the committee are asking the Minister to withhold the sum of £5 from his remuneration.

A Part-time Assistant

Three insurance doctors, each with the maximum number of insured patients, are in partnership and have recently had to refuse new acceptances in order to bring their lists within the permitted maximum. The partners realise that to refuse acceptances may adversely affect their practices, and have applied for the consent of the insurance committee to their employing an assistant, but they take the view that the extra number of insured persons likely to secure inclusion in their lists would not justify the expense of a whole-time assistant, and so they have asked to be allowed to have an assistant for two days a week until the extra number of insured persons justifies the appointment of a full-time assistant. The maximum additional number of patients who may be accepted by virtue of employing an assistant is 1500, and the committee have acceded to the doctors' request upon the condition that while the assistant is employed for not less than two days a week the additional number of insured persons accepted shall not exceed 350.

PUBLIC HEALTH

Diphtheria v. "Bacteriological Diphtheria"

PUBLIC authorities who control not only schools, day and residential, in which cases of diphtheria may occur but also infectious diseases hospitals to which they are removed are as much concerned to limit the number of cases as to economise the occupation of beds. There can be no question that the child with definite or even suggestive clinical evidence of diphtheria is properly removed to hospital for further investigation and treatment. There is equally no question that the increasing practice of indiscriminate swabbing without virulence tests and without determination of the state of immunity by Schick tests results in the unnecessary hospitalisation of numbers of children who are neither in danger themselves nor dangerous to the community from which they are removed. Entitled "Nomenclature of Diphtheritic Infections," a report just published¹ presents the conclusions of a L.C.C. departmental committee appointed by Sir Frederick Menzies. The title is an understatement of the contents of the report which covers far wider ground, since procedure is suggested for dealing with children, both immunised and non-immunised, in schools and homes of all types from whom positive swabs have been obtained but who show no clinical manifestations of diphtheria.

Diphtheritic infections include the various clinical forms of the disease, "bacteriological diphtheria"—that "tautological and meaningless" label—and carriers both convalescent and contact. Diphtheria is defined in the report as the reaction of the body to virulent strains of the *C. diphtheria*, and the keynote throughout is insistence upon virulence tests of the organism in the absence of clinical signs of the disease. Attention is drawn to the danger to others of the child suffering from anterior nasal diphtheria, in the opinion of the committee the commonest source of infection, particularly in schools and hospital wards. The condition, although intensely infective, produces as a rule nothing more than nasal discharge and debility which may be unremarked until severe types of the disease have arisen in other children as the result of contact. There can be no doubt that frank nasal diphtheria is a greater menace than the occult carrier state, since the dosage of infection transmitted is likely to be greater.

In the production of convalescent carriers there are, the report says, only two factors: a clinical attack of the disease and an unhealthy condition of the nasopharyngeal mucosa. The factors which are operative in producing "healthy" or contact carriers are the opportunity for and amount of infection and the local condition of the respiratory passages under which the bacillus may survive. What results from the contact-carrier state depends upon the state of immunity at the time of infection. Thus non-immunes may contract clinical diphtheria or, as the result of summation of subclinical doses of infection, attain "natural" immunity. Immunes may be transient contact carriers or become chronic carriers. It is emphasised that since they do not contract clinical diphtheria, the greater the number of immunes in a closed community the higher the carrier rate tends to become. In a community wholly immune, carriers are not harmful but bene-

ficient, since the repeated infection of immunes tends to raise, or at least to maintain, the level of anti-toxic immunity. The moral of this is obvious. The presence of virulent strains of the diphtheria bacillus in any considerable community of children is well-nigh inevitable. If some of these children are susceptible to the disease, outbreaks of clinical diphtheria are from time to time almost as inevitable.

Hence the report advocates the determination of the state of immunity of all inmates by means of the Schick test and the active immunisation of all positive reactors, confirmatory Schick tests being insisted upon. Half-measures are not only useless but detrimental to the progress of immunisation. It is among institutions whose inmates are only in part immune, or whose state of immunity following prophylactic injections has not been verified, that the objector (always on the lurk for mischief) finds some of his most venomous barbs. This lead from the largest public health authority in the world is to be welcomed by those who would put an end to the suffering of children from a preventable disease. The report proceeds to lay down the steps which should be taken for the disposal of cases under the various conditions of institutional practice, and concludes with an appendix in which are described the correct method of swabbing and the details which should be supplied to the bacteriologist; the inoculation of media; standard forms of report which should be used by bacteriologists; and the clinical significance of the bacteriological findings.

Practitioners who rely upon the morphological diagnosis of the diphtheria bacillus in a smear or culture may study with advantage the following scheme for the complete identification of the organism given on p. 16 of the report.

Stages in the Complete Identification of Virulent Diphtheria Bacilli and Time Occupied (in Days) from Taking the Swab

Day	Stage	Swab	
0	1st	Löffler	
0	2nd		
1	3rd	Micro. positive	Micro. negative.
1	4th	Inoculate tellurite plate	
3 (m.)	5th	Diphtheria-like colonies	Negative (diphtheroids or Hofmann only).
3 (m.)	6th	Inoculate serum agar	
3 (aft.)	7th	Inoculate fermentation tubes	
	8th	Read fermentation tests	Negative (diphtheroids or Hofmann only).
		True diphtheria bacilli	
4	9th	Virulence test	
5 or 6	10th	Result of test	Non-virulent diphtheria bacilli.
		Virulent diphtheria bacilli	

m. = morning; aft. = afternoon.

¹ Report of Departmental Committee (A. F. Cameron, E. H. R. Harries, A. Joe, J. E. McCartney, and A. Topping). London: P. S. King and Son, Ltd. No. 3161. 3d.

Intended primarily for the guidance of medical officers in the L.C.C. service, the report, which is a

reflex of modern practice in the control of diphtheria in institutions, should find a wider medical public. It contains a good deal for threepence.

Rat Plague

Early in December last a dead rat found in a grain warehouse at the docks at Liverpool was submitted to the bacteriologist for examination and found to be infected with plague. An intensive search and rat destruction campaign was immediately carried out in the vicinity, with the result that a few days later one of many trapped rats was also found to be infected. Although vigorous action has continued to be taken it would appear that no other plague-infected rats have been found, and there have been no human cases. The docks of Liverpool have an extensive trade with South America and the East, from both of which parts of the world plague-infected rats may gain access to this country, especially from grain-bearing ships.

It would probably be true to say that the destruction of rats on ships and on docks, and the search for plague-infected rats, has come to be the major activity of port sanitary authorities. During the year 1934, 2739 rats were caught in ships at the port of Liverpool, of which all but 2 were of the black variety, and in addition 2121 rats were caught on the quays, of which all but 156 were black. It is,

of course, the black variety of rat which is most likely to be infected with plague. The examination of rats for evidence of plague infection is carried out extensively; the number of rats examined at Liverpool in 1934 was 3486, of which all but 227 were black. Although the most careful precautions are taken (by exercising the powers and duties prescribed by the Port Sanitary Regulations, 1933) to keep down the rat population on ships, and to prevent the access of rats from ships to the shore, the danger of the introduction of plague is a cause of constant concern to port medical officers of health, and the prompt detection of the presence of plague-infected rats at Liverpool is evidence of the attention given to the subject. The more intensive activities which have followed the discovery seem to give assurance that no enzootic will occur in the area. Under present-day powers and administration a recurrence of the widespread rat infection which took place in East Anglia early in the century is highly improbable.

It is only occasionally that the importance of the large-scale routine work of the port sanitary authorities is prominently brought before the public, but port medical officers are well aware that if the work of their staffs was not carried out with assiduity and intelligence occurrences of this kind would not only be more frequent, but also much more serious.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

The death of H.M. King George V.—The *London Gazette* of Jan. 24th publishes Orders in detail for the mourning to be worn by Officers of the Royal Navy and Royal Marines, Officers of the Army, and Officers and Warrant Officers of the Royal Air Force for six months from Jan. 21st, ending July 20th, 1936.

Surg. Comdrs. G. W. Woodhouse to R.N. Hospital, Portland; R. W. Higgins to *President* for course; and W. G. C. Fitzpatrick to *Victory* for R.N.B., and to *Vernon*.

Surg. Lt.-Comdr. T. F. Crean to *Pembroke* for R.N.B., Chatham.

Surg. Lt. (D.) R. W. Stevens promoted to rank of Surg. Lt.-Comdr. (D.).

Surg. Lts. D. W. Walker to *Pembroke* for R. M. Infirmary, Deal; and T. McCarthy to *Furious*.

VACANCIES FOR MEDICAL OFFICERS AND SURGEON LIEUTENANTS (D.)

Applications are invited for eight vacancies in April for Medical Officers in the Royal Navy. Copies of the regulations for entry, conditions of service, &c., may be obtained from the Medical Director-General of the Navy, Admiralty, S.W.1, and from the Deans of all Medical Schools. Applications for entry must be received not later than Feb. 22nd.

The establishment of Dental Officers in the Royal Navy has been increased and applications are invited for appointment to commission as Surgeon Lieutenants (D.). Application forms and a pamphlet may be obtained from the Medical Director-General of the Navy, Admiralty, S.W.1. Applications for entry in March must reach the Medical Director-General not later than Feb. 6th.

ROYAL NAVAL VOLUNTEER RESERVE

H. B. Howell entered as Proby. Surg. Lt.
Proby. Surg. Lt. H. J. Wade to *Excellent*.
Proby. Surg. Sub-Lts. D. S. Macphail and J. A. Shepherd to be Surg. Sub-Lts.

ROYAL ARMY MEDICAL CORPS

Maj. T. C. Bowie retires on ret. pay.
Capts. T. W. Davidson and C. R. Christian to be Maj. (Substituted for notification in the *Gazette* of May 8th, 1934.) (*Vide THE LANCET*, May 19th, 1934, p. 1080.)
Capt. J. G. E. Vachell to be Maj. (Substituted fo

notification in the *Gazette* of Feb. 15th, 1935.) (*Vide THE LANCET*, Feb. 23rd, 1935, p. 450.)

TERRITORIAL ARMY

Capt. G. W. Wright, M.M., T.D., to be Maj.
Lt. R. Rutherford to be Capt.
Hugh Weir (late Cadet Serjt., Glasgow Univ. Contgt., Sen. Div., O.T.C.), to be Lt.
James Lockhart Gowan (late Cadet, George Watson's Coll. Contgt., Jun. Div., O.T.C.), to be Lt.

ROYAL AIR FORCE

The undermentioned Flying Offrs. are promoted to the rank of Flight Lt. :—

A. W. Smith, J. W. Patrick, J. S. Wilson, C. A. Lewis, R. G. James, and G. H. Stuart.

Flying Offrs. C. M. Carlyle-Gall to R.A.F. Station Aldergrove; E. B. Harvey and D. S. MacL. MacArthur to Medical Training Depot, Halton, on appointment to short service commissions.

Flying Offr. R. S. Peill to R.A.F. Station, North Coates Fitties.

Dental Branch.—Flight Lt. J. G. Stewart is transferred to the Reserve, Class D.

Flying Offrs. D. P. Boyle to No. 5 Flying Training School, Sealand; K. G. Swiss to No. 3 Flying Training School, Grantham; and H. M. G. Williams to Headquarters, Coastal Area, Lee-on-the-Solent.

VACANCIES FOR COMMISSIONS IN THE MEDICAL BRANCH

Applications are invited from Medical Men for appointment to Commissions in the Medical Branch of the Royal Air Force, for entry in May, 1936. Copies of the regulations and form of application may be obtained on application from: The Secretary, Air Ministry (D.M.S.), Adastral House, Kingsway, W.C.2. Completed applications from intending candidates for the vacancies in May, 1936, must be received in the Air Ministry not later than March 17th, 1936.

INDIAN MEDICAL SERVICE

Col. W. H. Hamilton, C.I.E., C.B.E., D.S.O., F.R.C.S., I.M.S., is apptd. Hon. Physician to the King, Oct. 22nd, 1935, vice Col. E. C. Hodgson, D.S.O., I.M.S., retd.

Indian Medical Department.—Maj. (Sen. Asst. Surg.) L. P. Gernon retires.

USE OF ANALGESICS BY MIDWIVES

REPORT OF AN INVESTIGATION BY THE BRITISH COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS¹

At the request of the National Birthday Trust Fund the British College of Obstetricians and Gynæcologists has carried out an investigation to ascertain if there is any form of analgesia (relief from pain) which can be used with safety and success by a midwife in the absence of a medical practitioner. The trial has been made in institutions, as adequate medical supervision and facilities for the necessary observation and accurate recording of results are more readily available in such places. Thirty-six hospitals, for the most part maternity hospitals or departments attached to medical schools, accepted the invitation to take part in the investigation.

Five methods were adopted for investigation: (1) chloroform capsules, (2) the Christie Brown chloroform inhaler, (3) the Mennell chloroform inhaler, (4) the Minnitt gas-and-air apparatus, (5) the administration of paraldehyde per rectum. The records of nearly 10,000 cases have been studied and classified into three main groups: (1) nitrous oxide and air, (2) chloroform, (3) paraldehyde.

Nitrous Oxide and Air

Nitrous oxide and air was administered with the Minnitt apparatus to 3865 cases, and in 627 of them an additional anaesthetic was administered, mainly on account of some obstetric difficulty. Nitrous oxide and air was thus administered to 3238 cases without any supplementary anaesthetic or analgesic. In this series there were three maternal deaths which were in no way due to the analgesia. Among the 627 cases in which an additional anaesthetic was administered there were six maternal deaths; in every case the death was the result of serious obstetric difficulty and in no case was it attributable to the administration of the gas and air.

The stillbirth-rate when the Minnitt apparatus alone was used was 2.0 per cent. When administered by a sister, staff-nurse, or pupil-midwife it was 1.2 per cent. The higher stillbirth-rate in cases undertaken by a medical practitioner is accounted for by the fact that he would be more likely to be called upon in difficult cases in which a relatively high stillbirth-rate is to be expected. When a full anaesthetic was given (frequently on account of some obstetric abnormality) the stillbirth-rate was 4.3 per cent. The stillbirth-rate for the whole series, however, shows that the method does not involve any added risk to the foetus, and the low stillbirth-rate when the analgesic was self-administered (or administered by a pupil-midwife) indicates that the actual administration does not call for more special skill than that which may be acquired by a midwife during her period of training.

The number of cases in which obstetric interference was necessary is an indication of the degree to which the normal forces of labour were interfered with. In the series of 3865 it was 8.4 per cent. (forceps delivery alone 6.6 per cent.), and as these figures compare favourably with the interference-rate in ordinary practice, the conclusion is justified that this method has no deterrent influence on the natural course of labour.

¹ The report, of which this is a summary, was passed by the College at its meeting on Jan. 25th, 1936, and is signed by the president, Sir Ewen Maclean. Copies may be had, price 1s., from the hon. secretary of the College, 58, Queen Anne-street, London, W. 1.

The records of the patients who received analgesia from the Minnitt apparatus have been analysed (Table I.) as regards the efficacy of the method.

TABLE I

	Per cent.
Satisfactory	77.0
Doubtful	5.3
Unsatisfactory	17.7

Investigation was further made into the relative effectiveness of this form of analgesia when self-administered or when administered by persons of varying degrees of experience. The proportion of cases in which satisfactory analgesia was obtained with various classes of administrators is set out in the table below. Table II. is an analysis of 3238 cases in which the Minnitt gas-and-air apparatus was used without any additional anaesthetic or analgesic.

TABLE II

Efficacy of Gas-and-Air Analgesia in the Hands of Various Administrators

Administered by—	Total cases.	Percentage of satisfactory cases.
Patient herself	1086	88.0
Pupil midwife or Medical student | .. .. .	553	81.4
Midwife	797	82.1
Medical practitioner	802	82.8

CONCLUSIONS

(1) The investigation has proved that the administration of gas and air by the Minnitt apparatus is safe for use by midwives in hospital, provided that a recent examination by a medical practitioner has revealed no contra-indication thereto.

(2) The use of that apparatus should be restricted to those midwives who have had a special training in its use, and who have shown themselves capable of managing it. Such training could be carried out concurrently with that for the certificate of the Central Midwives Board when the proposed longer period of training is adopted. For those already holding the C.M.B. certificate a special course would be required. The reasons for stressing the importance of a long training are that it requires considerable experience to learn the essentials of obstetric analgesia. Furthermore, experience in mechanical adjustments and in the changing of gas cylinders is essential if the machine is to work efficiently.

(3) Gas and air administered by the Minnitt apparatus produces satisfactory analgesia in a high proportion of cases. Sometimes, however, there is a restlessness and difficulty in controlling the patient; it is essential, therefore, that one other responsible person should be present in addition to the midwife in charge of the case.

(4) Further experience is necessary before the suitability of the Minnitt apparatus for domiciliary practice is proved, as this investigation has only been carried out in hospitals where additional help was always readily obtainable.

(5) Owing to the weight and bulk of the apparatus, transport would present serious difficulties if used in domiciliary practice, but it is possible that the wider use of "light" cylinders and further simplifications of the apparatus may go far to solve this problem.

(6) The apparatus presents certain mechanical difficulties which have necessitated return to the makers. Whilst due regard must be given to those difficulties, it may be possible to overcome them, once there is a sufficient demand to stimulate mecha-

nical improvements. It must be borne in mind, however, that a certain amount of mechanical aptitude would be still required to change cylinders of gas and to make minor adjustments. Such adjustments involve the use of a spanner and the frequent inspection of washers and joints.

(7) The cost of the apparatus is a handicap to general use. Apart from the initial expense, the cost of the nitrous oxide is high. Moreover, there is a serious risk of wastage owing to the fact that, as the apparatus is now constructed, leakage may occur at many places unless constant attention is given to minor adjustments.

Chloroform

In the majority of patients chloroform analgesia was used alone, but in some it was necessary (frequently on account of some obstetric abnormality) to supplement the analgesia with general anaesthesia. Thus, for each method the patients have been divided into two groups (Table III.), and the maternal deaths in each group have been recorded.

TABLE III

Maternal Deaths with Different Methods of Chloroform Analgesia

Method.	Analgesia alone.		Analgesia plus general anaesthesia.	
	Total cases.	Deaths.	Total cases.	Deaths.
Chloroform capsules ..	2338	1	194	0
Mennell inhaler ..	1430	1	141	2
Christie Brown inhaler..	809	0	63	2
Total	4577	2	398	4

Thus the maternal mortality-rate in this group of 4975 patients was 1·2 per thousand. From a study of the details of these six deaths, the conclusion reached is that chloroform was directly responsible for death in one case, that it was probably an important factor in the fatal issue in two cases, and that it was in no way responsible for death in three cases.

The total stillbirth-rate for all cases in which the analgesia was obtained (Table IV.) by the use of

TABLE IV

Stillbirth-rate with Different Methods of Chloroform Analgesia

Method.	Analgesia alone.		Analgesia plus general anaesthesia.	
	Total cases.	Stillbirth rate per cent.	Total cases.	Stillbirth rate per cent.
Chloroform capsules ..	2338	2·4	194	17·5
Mennell inhaler ..	1430	1·3	141	4·3
Christie Brown inhaler..	809	1·9	63	3·2

chloroform was 2·6 per cent. It includes all cases in which obstetric interference became necessary after the analgesia had been started, so that it may be said that there is no evidence that the chloroform analgesia is attended by increased risk to the foetus.

The interference-rate for all cases receiving chloroform capsules was 5·3 per cent. (forceps delivery 3·7 per cent.). Thus there is no evidence that the

use of chloroform as an analgesic in these cases caused any material interference with the normal forces of labour. Table V. shows the efficacy of the analgesia produced by the three methods investigated.

TABLE V

Efficacy of Analgesia with the Three Methods of Chloroform Analgesia

	Chloroform capsules, per cent.	Mennell inhaler, per cent.	Christie Brown inhaler, per cent.
Satisfactory ..	81·8	84·9	78·8
Doubtful ..	3·7	2·7	6·3
Unsatisfactory ..	14·5	12·4	14·9

Investigation has been made into the proportion of the patients in whom satisfactory analgesia was obtained when the analgesic was administered by persons of varying degrees of experience. Table VI. is an analysis of the cases in which no additional anaesthetic was given.

TABLE VI

Efficacy of Chloroform Analgesia in the Hands of Various Administrators (percentage of patients who obtained satisfactory analgesia)

Administered by—	Chloroform capsules.		Mennell inhaler.		Christie Brown inhaler.	
	Per cent.	Cases.	Per cent.	Cases.	Per cent.	Cases.
Patient herself ..	87·7	(277)	83·4	(177)	82·1	(252)
Pupil midwife or medical student	81·8	(1239)	81·5	(92)	82·2	(157)
Certified midwife	83·9	(695)	92·1	(559)	81·3	(347)
Medical practitioner	86·6	(127)	93·7	(302)	86·8	(53)

Note.—The figures in parentheses represent the total numbers of cases in the several groups.

CONCLUSION

Chloroform by any method should not be used by midwives acting alone. This conclusion has been reached with regret, but both the immediate and delayed dangers which are well recognised occurred in this investigation, and it is not possible fully to guard against such occurrences if the administration of chloroform is in inexperienced hands. This finding should not be taken to prejudice the administration of chloroform in midwifery by registered medical practitioners who, aware of the dangers, can take precautions to lessen the risks.

Paraldehyde

While there can be no doubt that in some selected cases the use of paraldehyde, given in oil per rectum during the first stage of labour, may be a valuable means of relieving pain, the general opinion of those who have used it as a routine method in this investigation is that it is unsuitable for general use by midwives. In arriving at this conclusion they have had in mind the technical difficulties in administering the drug, the need for careful selection of suitable patients, the choice of time for giving the injection, its variable action even when patients are carefully selected, and the inadequate analgesia at the time of the actual birth of the child. This last is probably the most important objection to its widespread use by midwives, since, even if effective in the early stages of labour, some additional method of analgesia must be provided if the pain associated with the moment of birth is to be relieved.

CORRESPONDENCE

BACTERIOLOGICAL TESTING OF MILK

To the Editor of THE LANCET

SIR,—Your issue of Jan. 11th comments on an extract from my annual report for 1934, dealing with the bacteriological examination of samples of graded milk, which appeared in the *Medical Officer* of Dec. 28th, 1935. "Dr. Howell," it is remarked, "is hardly being fair when he assumes that variations in count are due to the failure of bacteriologists to 'faithfully and carefully carry out the suggested procedure.'" Other factors are suggested as the likely cause of the widely different results given by different laboratories of the examination of samples of the same milk. "The factor which probably has most effect on the bacterial content of milk is the state of the weather, which is altogether outside the bacteriologist's control." Unless samples are transported to the laboratory on ice "there may be big variations in bacterial growth within a short period of transit."

This fact is of course well known by everyone with an elementary knowledge of milk bacteriology, but cannot be advanced as an explanation of the wide divergence of the figures in the reports I have quoted. One bottle of milk was taken and after thorough shaking was divided into six parts. The milk, before division, and the bottles into which it was placed were of an even temperature. The bottles were immediately packed into an efficient ice-box and conveyed to the laboratories. The difference in time taken for delivery of the parts which were reported to have the lowest (9270) and the highest (3,400,000) total counts was about 20 minutes. The temperature of the milk upon arrival was stated by the laboratories to be 13°C. in the first case and 11°C. in the second case. It will be seen that the part for which the lower temperature was given was stated to have a bacterial count 360 times greater than that of the part for which the higher temperature was given. As a further proof that the temperature of the milk had nothing to do with the difference in the figures I have quoted, I would point out that each laboratory gave the same temperature for the two parts which they each examined, yet each laboratory gave different figures for the two parts, in one case the results varied from 147,000 to 3,400,000.

I fully appreciate the difficulties of trying to standardise a test of this sort and I have pointed out that particular attention must be paid to every detail. Your article states, "There are mechanical faults such as errors in the graduation of pipettes to be controlled"—but surely this is a difficulty quite easy to overcome. Every properly equipped laboratory should have standardised equipment.

The Milk and Dairies (Amendment) Act gives power to a local authority to withdraw a licence to sell graded milk, if reports on a dairyman's milk show that samples do not comply with the standards laid down. It would be most unfair if such action was taken on reports which gave incorrect figures due to the use of improperly graduated pipettes in the laboratory. I agree that the human element plays an important part in the bacteriological examination of milk. I still consider, however, that the tests are worthless unless they give more comparable results. I hold no brief for the dairyman who does not take every precaution to safeguard his milk but, at the same time, I sympathise with the man who may be called upon to answer charges on unreliable data.

Dairymen have been and are being prosecuted for selling graded milks not in conformity with the standards. In view of my experience it may well be that some at least are innocent of the charges made against them.—I am, Sir, yours faithfully,

J. B. HOWELL,
Jan. 24th. Medical Officer of Health, Hammersmith.

MEDICAL EDUCATION AND BLOOD EXAMINATION

To the Editor of THE LANCET

SIR,—I should like to endorse all that Dr. Herbert Brown says in his letter in your issue of Jan. 11th. The medical journals have unfortunately given little encouragement to the routine examination of the blood in diagnosis and prognosis in their editorials on the subject, and I was told by the head of a preparatory school that he wished me to discontinue "blood examinations" as "the boys didn't like it and other doctors were able to do their job without it."

The discovery of early leucocytosis in a lobar pneumonia saves much exhausting examination of the chest. The search for the return of the eosinophils justifies a daily differential count, the "drift from the left" being also noted, and are signs of improvement so much more certain than any symptom. There is just one additional point to stress—one should have a record of the patient's blood picture in normal health. To quote Dr. Brown, "the process is interesting, even fascinating" and extremely valuable. He has, I think, mentioned the one drawback—it takes an hour in each case.

I am, Sir, yours faithfully,
H. ANGELL LANE.
Battle, Sussex, Jan. 22nd.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED
JAN. 18TH, 1936

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2554; diphtheria, 1283; enteric fever, 13; acute pneumonia (primary or influenzal), 1219; puerperal fever, 46; puerperal pyrexia, 105; cerebrospinal fever, 22; acute poliomyelitis, 3; acute poliomyelitis, 2; encephalitis lethargica, 5; dysentery, 23; ophthalmia neonatorum, 87. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Jan. 24th was 3964, which included: Scarlet fever, 1120; diphtheria, 1129; measles, 475; whooping-cough, 610; puerperal fever, 19 mothers (plus 13 babies); encephalitis lethargica, 283; poliomyelitis, 5. At St. Margaret's Hospital there were 20 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox, 3 (3) from enteric fever, 58 (7) from measles, 6 (1) from scarlet fever, 27 (11) from whooping-cough, 42 (3) from diphtheria, 37 (11) from diarrhoea and enteritis under two years, and 89 (18) from influenza. The figures in parentheses are those for London itself.

The mortality from influenza is falling, the total deaths for the last seven weeks (working backwards) being 89, 110, 110, 80, 67, 62, 45. The deaths this week are scattered over 52 great towns, Leeds reporting 7, Birmingham 6, Newcastle-on-Tyne 3, no other great town more than 2. Liverpool had to report 19 deaths from measles, Manchester 9, Croydon and Salford each 3. Liverpool also had 4 deaths from whooping-cough, Manchester 2. Deaths from diphtheria were reported from 28 great towns, Hull, Manchester, Oldham and Sunderland each reporting 3; Leeds, Liverpool, Birmingham, and Swindon each 2.

The number of stillbirths notified during the week was 259 (corresponding to a rate of 42 per 1000 total births), including 43 in London.

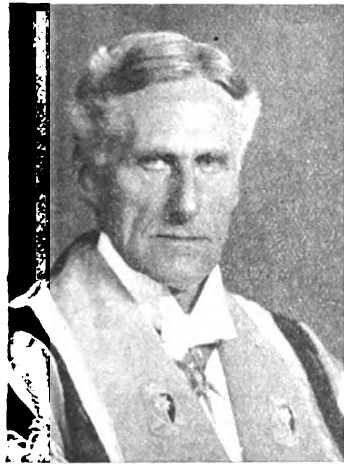
OBITUARY

**WILLIAM BLAIR-BELL, M.D. Lond.,
F.R.C.S. Eng.**

LATE PRESIDENT, BRITISH COLLEGE OF OBSTETRICIANS AND
GYNÆCOLOGISTS

THE news of the sudden death of Prof. Blair-Bell, which occurred on Saturday last, Jan. 25th, has been received with deep regret by the medical world and a large circle of public and private friends. He enjoyed a great and even international reputation as gynæcological and obstetrical surgeon with a large scientific outlook.

William Blair-Bell was born at Wallasey in 1871, the son of the late Dr. William Bell, J.P., and Helen, daughter of the late General Butcher. He received his general education at Rossall and went for his medical training to King's College, London, where



PROF. BLAIR-BELL

Photograph by Elliott & Fry

he was a successful student, Warneford and Junior medical scholar, prizeman in physiology and obstetric medicine, and Tanner prizeman in gynæcology. He took the double English diploma in 1896 and graduated as M.B. London in the following year, when he was elected an Associate of King's College. He was prosector at the Royal College of Surgeons of England, and demonstrator of anatomy and physiology in King's College, and early showed his mark

as clinician and observer by papers in the King's College Hospital Reports, the *Edinburgh Medical Journal*, and *The Lancet*. He proceeded to the M.D. Lond. in 1902 and took the B.S. Lond. in 1904.

He now returned to Liverpool, with which city he was for the next 30 years and more so importantly connected. He was appointed in 1905 gynæcological surgeon in charge of out-patients at the Royal Infirmary, Liverpool, and held appointments also at the Wallasey Cottage Hospital and the Wallasey Dispensary. His work immediately attracted wide attention. He communicated regularly to the *Proceedings* of the North of England Gynæcological Society, and his coöperation became sought by the editors of systematic treatises. He wrote the articles on malformation of the uterus, injuries to the uterus, fistulæ of the uterus, and subinvolution of the uterus, in Latham and English's system of treatment; he wrote the section on obstetric operations and on sexual functions in women in the "Practitioners' Encyclopædia," and the chapter on operations on the Fallopian tubes in Burghard's "System of Operative Surgery." His papers in *The Lancet*, *British Medical Journal*, *Practitioner*, and the *Proceedings* of the Royal Society of Medicine, sometimes alone and sometimes in collaboration, all showed him to be a resourceful surgeon with an unusual knowledge of physiology—papers published in the *British Medical Journal* on the physiology of the

female genital organs (in collaboration with Pantland Hick) and a communication to the Royal Society of Medicine on the relations of calcium metabolism to menstruation may be instanced.

In 1910 Blair-Bell gained the John Hunter medal of the Royal College of Surgeons of England and the triennial prize for an essay on the anatomy and physiology of the pituitary body and the relationship with disease of its abnormal and morbid conditions. Two years later he delivered the Arris and Gale lectures before the College, taking as his subject the genital functions of the ductless glands in the female. The lectures which were printed in *THE LANCET* with full illustrations showed not only the advanced nature of Blair-Bell's physiological studies and his acquaintance with detailed laboratory work in biochemistry, but also his wide reading and philosophical outlook. In 1913 he became full gynæcologist and surgeon at the Royal Infirmary, and in 1921 he was appointed professor of these subjects in the university. He held the chair in the university for ten years and was emeritus professor at the time of his death. As a teacher he was thoroughly in his element; it is not too much to say that under him there flourished the best teaching department in gynæcology of any British school.

Blair-Bell, who had now been president of the North of England Gynæcological Society and vice-president of the section of obstetrics and gynæcology at the Royal Society of Medicine, made in 1925 his first long and formal statement of views upon cancer, which afterwards became the subject of much discussion. He delivered on Nov. 10th of that year, before the Academy of Medicine in Toronto, an address on the specific character of malignant neoplasia with special reference to the control of cancer from this standpoint, and in the course of the address revealed the intensive study of the subject on which he had been engaged in coöperation with a group of Liverpool workers.

HIS WORK ON CANCER

Prof. Walter J. Dilling, director of the department of pharmacology of Liverpool University, sends the following account of this work:—

"It is a sorrowful privilege for one who has been closely associated with Blair-Bell's investigation into the nature and control of malignant disease to write a historical eulogy upon his brilliant and indefatigable endeavours to elucidate this problem. He was urged to research upon cancer by a yearning for knowledge with which he might alleviate human suffering and prolong life, and, in 1909, he formulated his "working hypothesis"—namely, that the chorionic epithelium, particularly the syncytium, was a normally malignant tissue and that a means, which could check its development, would be useful in arresting the progress of malignant growths.

"At first he explored the idea that the invasive properties of chorionic epithelium might be arrested by embryonic or placental extracts, but, when these failed, he concentrated his attention on the fact that lead salts caused abortion and were particularly deleterious to young life, surmising, as a corollary, that they might restrain the growth of neoplasms. The discovery that lead destroyed spermatozoa in the testes and induced coagulation necrosis in the ectodermal tubules of the chorion, encouraged him to treat, on Nov. 9th, 1920, an inoperable spheroidal-celled medullary carcinoma of the breast by intravenous injections of a partly colloidal lead iodide—

within a month the growth had practically disappeared, the enlarged glands subsided, and this patient is still alive. Other hopeful improvements were achieved in a variety of cases and, at a meeting on Jan. 30th, 1923, the late vice-chancellor of Liverpool University, Dr. J. G. Adami, inspired the formation of a Cancer Research Committee, which consisted originally of Sir Robert Jones, Messrs. J. A. Smith and Rex Cohen, with the present registrar of the university, Mr. Edward Carey, as acting secretary, in order to subsidise and facilitate researches upon Blair-Bell's theories and remarkable clinical results.

"Blair-Bell's knowledge of the modern advances in the medical sciences was admirably and amazingly comprehensive, but he recognised that satisfactory and rapid progress towards his objective could be achieved only by employing the 'Aggregate Mind' of his scientific colleagues. His preliminary results and his aspirations were communicated to Prof. W. C. M. Lewis (physical chemistry), the late Prof. E. E. Glynn (pathologist), and the writer (pharmacologist), who agreed to assist in the investigation. Funds, provided at first through the generosity of the Cancer Research Committee—notably by Mr. Rex Cohen—defrayed the cost of early researches and provided free treatment for poor patients in nursing homes; but, later, when the Liverpool Medical Research Organisation was incorporated for charitable purposes, financial support for the work was derived partly from voluntary subscriptions and partly from the fees of patients. Cordial coöperation was maintained between the scientific and clinical workers at the frequent meetings with Blair-Bell, when results were criticised and the scientific staff informed of the clinical effects or defects of new preparations of lead. At these discussions Blair-Bell's intellect was dominant, and displayed an alert elasticity with quickness of perception which justified his position as director and organiser of researches covering extensive fields of modern science.

"Publications by Blair-Bell and members of the scientific and clinical staff appeared from 1922 onwards, and by 1930 some 64 papers had recorded the results of intensive investigations on many aspects of the cancer problem and of the influence of lead on normal and malignant tissues. These researches were subsequently collected and co-related by Blair-Bell in 'Some Aspects of the Cancer Problem,' and a consideration of the evidence contained therein will vindicate Blair-Bell's reputation from the suggestion that he maintained undue reticence about his methods or results, will substantiate the reasons for his caution in endeavouring to restrict the general therapeutical use of lead compounds in malignant disease until their specific value was more definitely determined and their toxicity more easily controlled, and will also justify his belief that lead salts exert an inhibitory influence on some forms of neoplasms. Interest in the work was excited in many parts of the world, and supporting evidence accumulated from many sources, amongst others from Carter Wood in America. As the investigation proceeded, changes and—latterly from lack of funds—restrictions in the fields of the research became necessary. Prof. I. M. Heilbron's collaboration—and recently that of Prof. A. Robertson—achieved the synthesis of many less toxic compounds of lead and the beneficial effects of these in selected cases continued to maintain the hope that the pursuit of this line of inquiry would ultimately yield a compound of lead which possessed greater and more reliable inhibitory effects on tumours both in animals and in man.

"Although he retired from his chair and active practice in 1931, Blair-Bell still maintained an intimate relationship with this research work which, under the direction of Dr. Morris Datnow, continues, so far as restricted funds permit, to be prosecuted actively in Liverpool, both in its scientific and clinical aspects and with results which continue to support the view that intravenous injections of suitable lead compounds do cause in a percentage of cases a retardation or even retrogression of some malignant growths. The work of the Liverpool Medical Research Organisation as a scientific body is a memorial, if still imperfect and incomplete, to the untiring zeal and devotion of Blair-Bell to the advancement of medical science, an objective for which he was always prepared to make personal sacrifices."

Blair-Bell, while frequent in his contributions to contemporary literature, had a useful treatise to his credit dating from an early period in his career. In 1911 appeared his large treatise, the *Principles of Gynaecology*, in which he endeavoured to present a complete and modern survey on which gynaecology should be established. The work was concise and readable, drawn up on a simple and logical arrangement, and admirably produced. While following academic lines in general he challenged attention by the stress which he laid on the importance of the calcium content of the blood and on the large part played by the secretions of the ductless glands in the causation of certain gynaecological conditions. In many directions the lapse of time would seem to have confirmed observations which were not all at the time generally accepted. This was his only textbook.

FOUNDATION OF THE COLLEGE

Blair-Bell erected a permanent memorial to his energies and his high conception of his branch of medical and surgical work when he became the prime advocate of the foundation of the British College of Obstetricians and Gynaecologists. He put forward vigorous arguments for the institution of such a college; he replied trenchantly to those who held the opposite view, and when in 1929 the college came into being it was recognised as absolutely fitting that he should be elected the first president. At the last dinner of the college Lord Dawson spoke of him as "the restless, lovable torch-bearer who never forgot—or allowed anybody else to forget—that he was bearing a torch," and his branch of the profession will never forget their debt to him.

Dr. J. S. Fairbairn, Blair-Bell's immediate successor in the presidency, writes:

"Blair-Bell's was a striking and forceful personality. Gaunt with ascetic features that did not belie the earnestness and grim determination that lay beneath them, he pursued whatever he took up with almost fanatic zeal. Gifted with a fine intellect, the power of dramatic expression, and of wide interests, he was a delightful host and companion. No one of his day and generation exercised a greater influence on British gynaecology than Blair-Bell, an outstanding instance of which was his prominent part in the foundation of the British College of Obstetricians and Gynaecologists. In spite of indifferent health, he threw himself, body and soul, into the work of drawing up its constitution and seeing through its incorporation, and, after his election as its first president, of establishing it in the position he had determined it should occupy. He had ambitions regarding the high place the new college should take and was inclined to be impatient with those, both within and without the

college, who were unable to accept his own estimate. There can be little doubt that this impatience arose in great measure from the knowledge that his life hung by a thread and might end as it did. He was certainly lavish in the expenditure of his strength and energy, for no details escaped him or were too small for his undivided attention. Nowhere will the passing of William Blair-Bell be more deeply mourned than in the college that meant so much to him and owes so much to him."

The following is a brief enumeration of the appointments that Blair-Bell held at the time of his death. He was consulting gynæcological and obstetrical surgeon to the Royal Infirmary and the Maternity Hospital, Liverpool, and emeritus professor at the university of those subjects. He was the consulting director of the Liverpool Medical (Cancer) Research Organisation, president of the Royal Infirmary, Liverpool, and honorary fellow of many obstetrical societies, British and foreign. He was elected fellow of King's College, London, in 1928, and F.R.C.S. Eng. in 1929. He was an honorary fellow of the American College of Surgeons, the universities of Liverpool and Glasgow gave him the LL.D. degree, and he was a Commander of the Royal Order of the Star of Roumania.

Prof. Blair-Bell married his cousin, Florence, daughter of Mr James Bell, who predeceased him. They had no children. Those who enjoyed his friendship or acquaintance cannot fail to remember his personality, and to recognise the aptness of Dr. Fairbairn's words. Blair-Bell was of the stuff from which great men are made, and he was a great man both in example and accomplishment.

CHARLES ANDERSON FERGUS, L.R.C.P. Edin.

THE death is announced in his eightieth year of Dr. Charles Anderson Fergus, for many years medical officer for East Kilbride parish where the whole of his medical career was spent. He practised with his father, and within the memory of many he was always entitled "the young doctor," then he became popularly known as "Dr. Charles," and lived to be affectionately spoken of as "the old doctor." He had a particularly strong hereditary claim on the regard of the neighbourhood. His grandfather was ordained minister of the Relief church 140 years ago, while his father, Dr. James Fergus, who graduated in medicine 95 years ago, founded the medical practice in Kilbride immediately after qualification. Of Dr. James Fergus's two sons, the elder, who practised in Yorkshire, is still living at the advanced age of 88 years.

MURDO TOLME MACKENZIE, M.B. Edin.

Dr. Murdo Mackenzie, who died on Jan. 11th in his seventy-eighth year, had seen 50 years' service in the Scottish islands. He was the son of the factor of the MacLeod estate and was educated at Daniel Stewart's College and the University of Edinburgh, graduating as M.B., C.M. in 1880. He was early appointed medical officer for the whole parish of North Uist, and until recently had charge single-handed of the island and also of Grimsay, Heisker, and Berneray, but under the reorganisation of the Highlands and Islands service he became responsible only for the west side of North Uist. There he was parochial medical officer and M.O.II., surgeon to the Lockmaddy prison, and acted as sheriff substitute for Inverness-shire, of which county he was a J.P. He was also medical officer to the post office, and after

the war did considerable work under the Ministry of Pensions. He endured for most of his working life the great physical hardships of practice in the island district, and became an absolute repository of the physical and family stories of his whole environment, having been either publicly, professionally, or personally in contact with practically everybody. He had a fine record of service and his reputation is safe in the recollection of the people of North Uist.

THE LATE PROF. STARR JUDD

Edward Starr Judd was born in Rochester, Minn., on July 11th, 1878, and died on Nov. 29th, 1935, when on the way to address a meeting at Philadelphia. Having graduated at Minneapolis in 1902 he became an intern at St. Mary's Hospital, Rochester, and in the following year first assistant to Dr. C. H. Mayo, the remainder of his life being spent as a member of the Mayo Clinic. In 1918 he was appointed to the graduate chair of surgery in the University of Minnesota.

Prof. Grey Turner writes: "Those who know the Mayo Clinic will be very sorry to hear of the death of Edward Starr Judd while still on the good side of 60. At the time of my first visit to Rochester thirty years ago Judd was an able second to the brothers Mayo, and in fact those three constituted the sole surgical team of that day. He was even then doing a fair share of the operative work and appeared to be thoroughly familiar with all branches of surgery. From that time to his death, save for short vacations, he operated every day of the week except Sunday, and his lists seldom ran to less than six cases, so that in the course of his career he probably did more operations than any other surgeon.

"Judd was a first-rate all-round man, and though in recent years his work was mostly confined to the abdomen, he was never a specialist in any sense of the word. He was a beautiful steady operator, always the same, never fast never slow, and above all never put out or fussy. The patient always seemed safe in his hands, and many a spectator picked him out as *the* man to operate on those near and dear. But he was not only a renowned operator but a great doctor, and the investigation and care of his patients was thorough and sympathetic. His writings were not voluminous but were always practical and sound, and like his operative work showed good judgment throughout. In the clinic Judd was obviously an influence for good, and his earnest conciliatory manner must have been an enormous asset in such an organisation. He possessed the highest of all distinctions in that he was a *maker* of surgeons, and I have heard many now well known in the surgical world who have acknowledged this indebtedness to him.

"Judd was of a quiet, restful disposition, delighting in his work, in his home, and in loyalty to his chiefs, ever on his lips as 'W. J.' and 'C. H.' His one relaxation appeared to be duck shooting, but even that fascinating sport only lured him away from work for short periods. He will be missed far beyond his immediate circle."

In 1931-32 Prof. Judd was president of the American Medical Association.

ST. BARTHOLOMEW'S HOSPITAL, LONDON.—The Smithfield Benevolent Fund committee has raised £10,000 to establish visitors' rest rooms and a canteen at this hospital.

MEDICAL NEWS

University of Oxford

Radcliffe Travelling Fellowship.—An examination for this fellowship, which is of the annual value of £300 and is tenable for two years, will be held on Feb. 18th. Candidates must have passed all the examinations for the degrees of B.M. (not more than four years previously) and B.A. Further particulars may be had from the regius professor of medicine, University Museum, Oxford, to whom all intending candidates should send their names before Feb. 13th.

George Herbert Hunt Travelling Scholarship.—Applications for this scholarship, which is awarded without examination, are invited from graduates in medicine of the university of not more than five years' standing who wish to travel abroad for at least three months for the purpose of clinical study or research in medicine. Preference will be given to those who intend to become surgeons or general practitioners, and applications should be sent to the dean of the medical school, University Museum, before Feb. 24th.

University of Cambridge

On Jan. 25th the following degrees were conferred:—

M.D.—B. C. Thompson, C. H. Wrigley, and D. N. Roeyn Jones.

M.B. & B.Chir.—S. M. Davidson and K. C. Bailey.

M.B.—Wilfrid Warren.

B.Chir.—L. J. Bacon, T. L. H. Shore, G. N. St. J. Hallett, J. R. Kerr, J. R. G. Harris, A. G. Salaman, J. R. J. Winter, C. A. Dowding, Frank Stansfield, and R. D. Ewing.

Royal College of Surgeons of England

The Begley studentship will be awarded to the candidate who this year obtains the highest marks in the anatomical part of the examination in anatomy and physiology held by the conjoint examining board in March and April. The studentship is tenable for three years, and has an annual value of £20. Further information may be had from the secretary of the college, Lincoln's Inn Fields, W.C.

British Postgraduate Medical School

Six lectures on fractures will be given by Prof. Hey Groves on Fridays from Feb. 7th to March 13th, and four lectures on cerebro-spinal syphilis by Dr. Gordon Holmes, F.R.S., on Mondays from March 2nd to 23rd. Both series will be held at 2.30 P.M. at the school, and applications for tickets should be sent to the dean. Further particulars will be found in our advertisement columns this week.

Demonstrations of Contraceptive Technique

On Thursday, Feb. 6th, at 2.30 P.M., a demonstration of the technique of the use of a variety of contraceptive methods will be given by Mrs. Mario Stopes, D.Sc., and Dr. Evelyn Fisher at the Clinic for Constructive Birth Control, 108, Whitfield-street, London, W.1. Tickets will be issued to medical practitioners and senior students who apply in writing to the hon. secretary at the clinic.

British College of Obstetricians and Gynæcologists

The quarterly meeting of the council of the College was held on Jan. 25th in the College House, when Sir Ewen Maclean, the president, reported that a loyal address had been sent to H.M. King Edward VIII. He reported further that the outline of a scheme for a national maternity service had been submitted to the Minister of Health. The report of the investigation into the use of analgesics suitable for administration by midwives was passed.

The following were elected to the membership of the College:—

Alan John Stewart Lawson Boyd, South Africa; Mildred Isabel Ealing, London; Barton Gilbert, London; Stanley Henderson, Liverpool; Edwin Holmes, Hove; Charles Roy MacDonald, Sheffield; John Sinclair MacVine, London; Thomas N. MacGregor, Edinburgh; Stanley Devenish Meares, Sydney; Elizabeth Main Moore, London; Frederick Walter Gifford Nash, Bedford; John Gregory O'Donoghue, Melbourne; Patrick Playfair, London; Anthony Watson Purdie, Glasgow; Cleveland Patrick Scott, London; Edward Solomons, Dublin; William Ralph Winterton, London; Bryan Leslie Jeffreson, Leeds; Israel Goldberg, Cape Town; Presley Archer McLeod, Ontario; Cyril MacDonald Plumtre, Madras; and Harold Rowntree, Lahore—the four last-named in absentia.

Post-graduate Course in Orthopædic Surgery

A special course will be held at the Royal National Orthopædic Hospital, 234, Great Portland-street, London, W.1, from March 9th to 21st. Applications should be made to the secretary of the hospital.

Journées Médicales de Bruxelles

This congress will be held from June 20th to 24th under the presidency of Prof. Robert Danis. Further information may be had from the secretary of the meeting, Dr. R. Beckers, 141, rue Belliard, Bruxelles.

Physical Exercise and Education

On Tuesday, Feb. 4th, and on the following three days, at 6 P.M., Dr. J. Alison Glover, senior medical officer of the Board of Education, will lecture at Gresham College, Basinghall-street, E.C., on some aspects of exercise, physical education and swimming. The lectures are open to all.

The Psychological Clinic and Community Welfare

Four lectures on this subject will be held at the Liverpool Psychiatric Clinic (56, Bedford-street North) on Wednesdays from Feb. 5th to 26th at 5.15 P.M. Juvenile courts, probation work, patrol work, and industrial and vocational psychology are the aspects which will be discussed.

A Memorial to Prof. A. F. Dixon

A meeting of friends and colleagues of the late Prof. Francis Dixon was held in the Common Room, Trinity College, Dublin, on Jan. 24th, to consider the establishment of a suitable memorial to him. In the absence of the provost of the college the meeting was summoned by the vice-provost, Mr. W. E. Thrift, who presided over the deliberations. Several projects having been discussed, a general committee was appointed to forward the movement, and an executive subcommittee was requested to study and report on the most suitable form of memorial. Prof. J. W. Bigger is acting as honorary secretary and Mr. G. A. Duncan, F.T.C.D., as honorary treasurer.

Standard Blood Counting Apparatus

A committee of the British Standards Institution have prepared a specification for haemocytometer counting chambers and dilution pipettes. The institution is desirous that this draft should receive the widest possible consideration, so that the specification, when finally published, may command the greatest possible measure of agreement. A copy of the draft specification may be obtained, post free, on application to the Director, British Standards Institution, 28, Victoria-street, London, S.W.1, to whom suggestions for amendment of the draft may be sent. Any comments submitted will receive careful consideration when the draft is being revised for publication.

Association of Industrial Medical Officers

The second meeting of this association was held in the London School of Hygiene and Tropical Medicine on Friday and Saturday, Jan. 24th–25th, under the chairmanship of Dr. H. B. Trumper (Imperial Chemical Industries Ltd.), in the absence of Dr. Howard Mummery through illness. On Friday a discussion took place on Physical Standards in Industry, opened by Sir David Munro, secretary of the Industrial Health Research Board (whose address is summarised in a leading article on p. 265). He was followed by Dr. H. H. Bashford, chief medical officer to the Post Office. In the evening members dined together. On Saturday, Dr. T. O. Garland (Carreras Ltd.) read a paper on The Relation between the Industrial Medical Officer and the General Practitioner. He was followed by Dr. J. C. Bridge, chief medical inspector to the Home Office. Dr. Garland spoke of the importance of closer co-operation and contact between industrial medical services and other medical practitioners, and referred to the place of treatment in the industrial clinic. He also discussed briefly the position of the employee and employer in relationship to the industrial doctor. Dr. Bridge dealt with the relationship of the certifying surgeon to the industrial medical officer.

Medical Diary

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Feb. 4th.

Orthopaedics. 5.30 P.M. (Cases at 4.30 P.M.) Mr. Eric Lloyd: A Director for the Insertion of the Smith-Petersen Nail in Collum Femoris Fractures. Mr. E. P. Brockman: 1. Osteochondritis of the Head of the Radius. Mr. W. H. Ogilvie: 2. Deformity of Spine and Hips. Mr. T. T. Stamm: 3. Occupational Deformity of the Hands.

Pathology. 8.15 P.M. (department of pathology, Medical School, St. Thomas's Hospital, S.E.). J. Bamforth: 1. Carcinoma of Thymus with Malignant Cells in Sputum. 2. Teratoma of Testicle with Positive Friedman Test. 3. Endotheliomatous Change in a Uterine Fibroid. C. L. G. Pratt: 4. Effect of Toxins on Electrocardiograms of Animals. 5. Method of Constant Intravenous Injection in Anaesthetised Animals. J. St. C. Elkington: 6. Actinomycosis of Brain and Meninges. 7. Hamangioma of Spinal Cord with Syringomyelia. 8. Oligodendroglioma of Third Ventricle. J. O. Oliver: 9. Gonococcus Ecto-antigen. 10. Hemochromatosis with Analysis of Organs. 11. Widespread Hepatic Thrombosis. 12. Pulmonary Thrombosis with Calcification of Clot. N. R. Barrett: 13. The Examination of New Growths by the Wet Film Method. D. C. L. Derry: 14. Plasma-celled Myelomatosis. 15. Chronic Inflammatory Lesion of the Lung with Complete Necrosis of Spleen. 16. Rheumatic Carditis Associated with the Presence of Bacteria in the Mitral Valve. C. H. Wrigley: 17. Demonstration of Particles of Malignant Growths in Sputum.

WEDNESDAY.

History of Medicine. 5 P.M. Prof. Alexander Haddow: Historical Notes on Cancer from the MSS. of L. W. Sambon.

Surgery. 8.30 P.M. Sir W. Dalrymple-Champneys: The Sterilisation of Surgical Catgut (cinematograph).

THURSDAY.

Tropical Diseases and Parasitology. 8.15 P.M. Prof. R. T. Leiper: The Crustacea as Helminth Intermediaries. Dr. B. G. Peters: Some Recent Developments in Helminthology.

FRIDAY.

Otology. 10.30 A.M. (Cases at 9.30 A.M.) Mr. W. Stirk Adams, Mr. T. E. Cawthorne, and Dr. M. Mitman: Value of Radiology in Disenses of the Ear.

Laryngology. 5 P.M. (Cases at 4 P.M.) Mr. Maxwell Ellis: The Mechanism of Bronchial Movements and the Naso-pulmonary Reflex.

Anaesthetics. 8.30 P.M. Dr. I. W. Magill: Anaesthetics in Thoracic Surgery, with Special Reference to Lobectomy.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.

FRIDAY, Feb. 7th.—8.30 P.M. (De Vere Hotel, Kensington), Dr. Geoffrey Evans and Mr. Hamblen Thomas: Epistaxis.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.

MONDAY, Feb. 3rd.—5 P.M., Mr. A. M. Boyd: The Investigation of Peripheral Vascular Disease.

WEDNESDAY.—5 P.M., Mr. H. Osmonde Clarke: Injuries of the Carpal Bones.

FRIDAY.—5 P.M., Mr. F. H. Bentley: Wound Healing in vitro. The Interrelation of Epithelial and Fibrous Tissue Growth. (Hunterian lectures.)

GRESHAM COLLEGE, Basinghall-street, E.C.

TUESDAY, Feb. 4th, and 5th, 6th, and 7th.—6 P.M., Dr. J. Alison Glover: Some Aspects of Exercise, Physical Education and Swimming.

UNIVERSITY OF LONDON.

WEDNESDAY, Feb. 5th.—3 P.M. (London School of Hygiene, Keppel-street, W.C.), Col. L. W. Harrison: Venereal Disease.

FRIDAY.—11 A.M., Mr. H. E. Mudge, D.Sc.: Nutrition.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.

FRIDAY, Feb. 7th.—2.30 P.M., Prof. Hey Groves: Fractures (first of six lectures).

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.

WEDNESDAY, Feb. 5th.—4 P.M., Mr. W. H. Ogilvie: Carcinoma of the Tongue.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.

TUESDAY, Feb. 4th.—5.30 P.M., Dr. T. F. Cotton: Rheumatic Carditis.

LONDON SCHOOL OF DERMATOLOGY, 5, Lisle-street, W.C.

TUESDAY, Feb. 4th.—5 P.M., Dr. J. E. M. Wigley: Tuberculosis Cutis.

THURSDAY.—5 P.M., Dr. G. B. M. Heggs: Some Affections of the Skin of the Foot.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

WEDNESDAY, Feb. 5th.—2 P.M., Mr. Denis Browne: Empyema. 3 P.M., Dr. W. W. Payne: Vitamin Deficiency as a Predisposing Factor in Infection.

Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, Feb. 3rd.—3.30 P.M., Dr. Hinds Howell: Neurosyphilis (II).

TUESDAY.—3.30 P.M., Dr. Critchley: Cerebral Vascular Disease (II).

WEDNESDAY.—3.30 P.M., Dr. Kinnier Wilson: Clinical Demonstration.

THURSDAY.—3.30 P.M., Dr. Carmichael: Myopathic Diseases.

FRIDAY.—3.30 P.M., Mr. Elmquist: Demonstration of Re-educational Methods.

Out-patient clinic daily at 2 P.M.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

MONDAY, Feb. 3rd.—10 A.M., Medical wards and skin clinic. 11 A.M., Surgical wards. 1.30 P.M., Gynaecological wards. 2 P.M., Surgical wards, gynaecological and eye clinics.

TUESDAY.—10 A.M., Medical wards. 11 A.M., Surgical wards. 2 P.M., Throat clinic. 4.15 P.M., Mr. Woodd Walker: Derangements of Knee-joint.

WEDNESDAY.—10 A.M., Children's ward and clinic. 11 A.M., Medical wards. 2 P.M., Eye clinic. 4.15 P.M., Lecture on anaesthesia.

THURSDAY.—10 A.M., Neurological and gynaecological clinics. 2 P.M., Eye and genito-urinary clinics.

FRIDAY.—10 A.M., Skin clinic. Noon, Lecture on treatment. 2 P.M., Throat clinic.

SATURDAY.—10 A.M., Surgical and children's clinics, medical wards.

Operations, medical and surgical clinics daily at 2 P.M. The lectures at 4.15 P.M. are open to all medical practitioners without fee.

ST. JOHN CLINIC, Ranelagh-road, S.W.

FRIDAY, Feb. 7th.—4.30 P.M., Mr. L. Attkins: Oral Sepsis in Relation to Physical Disease.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Feb. 3rd, to SUNDAY, Feb. 9th.—ST. JOHN'S HOSPITAL, 5, Lisle-street, Leicester-square, W.C. Afternoon course in dermatology (open to non-members).—ST. MARKS' HOSPITAL, City-road, E.C. All-day course in proctology.—WEST END HOSPITAL FOR NERVOUS DISEASES, Welbeck-street, W. All-day course in neurology.—ST. JOHN CLINIC AND INSTITUTE OF PHYSICAL MEDICINE, Ranelagh-road, S.W. Sat. and Sun. course in physical medicine.—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W. Tues., 8.30 P.M., Mr. A. J. Cokkinis: Intestinal Obstruction. Thurs., 8.30 P.M., Mr. T. Holmes Sellors: Thorax.—Courses are open only to members and associates of the Fellowship.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.

WEDNESDAY, Feb. 5th.—4 P.M. (St. James' Hospital, Ouseley-road, S.W.), Dr. C. E. Lakin: Demonstration of Medical Cases.

LEEDS GENERAL INFIRMARY.

TUESDAY, Feb. 4th.—3.30 P.M., Mr. Flint: Demonstration of Cases.

LEEDS PUBLIC DISPENSARY.

WEDNESDAY, Feb. 5th.—4 P.M., Dr. H. H. Moll: Minor Allergic Diseases—Hay-fever, Urticaria.

UNIVERSITY OF DURHAM.

SUNDAY, Feb. 9th.—10.30 A.M. (Newcastle General Hospital), Dr. F. J. Nattrass: Medical Ward Visit.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.

WEDNESDAY, Feb. 5th.—4.15 P.M. (Royal Hospital for Sick Children), Mr. Alexander MacLennan: Orthopaedic Cases.

Appointments

BLAIR, L. G., M.R.C.S. Eng., D.M.R.E., has been appointed Specialist Radiologist at the Dagenham Sanatorium.

KELLNER, ANDREW, M.D. Leipzig, L.M.S.S.A., Hon. Assistant Physician to the London Homeopathic Hospital.

LYON, D. MURRAY, M.D., F.R.C.P. Edin., Principal Medical Officer of the Scottish Widows' Fund and Life Assurance Society.

MACLEOD, DONALD, F.R.C.S. Edin., Clinical Assistant at All Saint's Hospital for Genito-urinary Diseases, London.

SLATER, EFFIE, M.B. Lond., D.O.M.S., Assistant Medical Officer to the Education Committee of Wolverhampton.

Medical Referee under the Workmen's Compensation Act, 1925: PERCIVAL JOHN HAY, M.D., of Sheffield, for all County Court Districts at present comprised in Circuits Nos. 13 and 18, with a view to his dealing with ophthalmic cases.

Certifying Surgeons under the Factory and Workshop Acts: Dr. OLIVE G. COLDICOTT (Abergavenny, Monmouth); Dr. W. E. FAULKNER (Alva, Clackmannan); and Dr. J. H. ALLAN (Chorley, Lancs).

Dr. J. B. Albury has been appointed a member of the legislative council of the Bahama Islands.

Dr. D. C. Norris (Inner Temple) and Dr. F. Collar (Middle Temple) have been called to the Bar.

NOTES, COMMENTS, AND ABSTRACTS

THE PSYCHOLOGY OF
INTERNATIONAL RELATIONS*BY WILLIAM BROWN, D.M. Oxon., D.Sc.,
F.R.C.P. Lond.WILDE READER IN MENTAL PHILOSOPHY, UNIVERSITY OF OXFORD;
LATE MAJOR, R.A.M.C., AND NEUROLOGIST TO THE
FOURTH ARMY, B.E.F., FRANCE

THE psychology of international relations, otherwise the psychology of peace and war, can be adequately discussed only on the basis of a scientific knowledge of the structure and working of the human mind. A number of questions open out: how war is possible; how it can be carried on at all by civilised people; how peace can be achieved, this last only by a positive policy, never by *laissez-faire*.

Hobbes said that peace was merely an interval between wars, the wars being the real—meaning the normal—activity, and peace a breathing-space, a time when people are tired, disillusioned, and a little penitent. Those who take part in war customarily declare that when they have finished this business they will fight no more. The protestation has much the same value as that of the drunkard who exclaims as he lifts the glass to his lips that it is the last time.

Speaking as a psychologist, not as a politician, I am convinced that the latest war is not the last. In saying this I do not mean to be pessimistic, I am merely speaking as I would about a manic-depressive patient who, after a state of deep depression, passes into one of exaltation and feels that never again will his old symptoms return. With a patient like that we know that he will have another relapse sooner or later, and that no amount of suggestion or encouragement will make any difference. It is of no use telling him or his relatives that "All's well with the world"; a relapse is as certain as anything can be. In cases of manic-depressive insanity or the milder cyclothymia, as in other forms of psychoses as distinct from psychoneuroses, a radical cure has not been found. No psychotic has ever yet been cured by psychotherapy as such, although psychotherapy and psychology in general have enabled us to gain a deeper insight into the psychotic's state of mind, and sometimes to ameliorate the condition. We may cure or improve the hysteric, the psychoneurotic, but the psychotic still escapes us—although improvement, and sometimes spontaneous recovery, may occur.

So it is with war and peace. We cannot pretend as psychologists that a solution has been discovered at present. All we can do is to go on and disentangle the various forces which are at work to produce war. The causes of war are numerous, and many of them seem to have little to do directly with human nature. The economic causes of war spring at once to the mind. According to some systems of practical economics wars are inevitable and must occur from time to time. Conflicts of interests exist between nations and may become so severe that an appeal is at last made to the *ultima ratio*, the final court of trial by brute strength.

Again it is necessary to make the psychologist's position clear. As a psychologist I am not advocating any particular system of economics as distinct from others. We psychologists feel some sympathy with the economists, for we are in the same boat. Psychology and economics are the two sciences about which the man in the street thinks he knows as much as the expert. He is not going to be informed about his own mind, for who should know his own mind better than himself? He knows all about economics too,

for does he not have to deal continually with credit balances and deficits? That is one reason why progress in these sciences is so slow.

Man's Reactions to His Mind

Deep down in the mind—in our "heart of hearts," as we say—we are aware of the struggle for existence, the desperate fight between man and man, family and family, nation and nation, for security, position, and power, a fight variously disguised, halted by compromise and mutual adjustment, but at times flaming into open war. Schopenhauer in one of his "Occasional Essays" likened human society to a number of hedgehogs that found themselves getting chilly in the winter and so got closer and closer together to keep one another warm, but as they drew closer their prickles hurt one another, and so they moved away and got cold again, and eventually by trial and error found an optimum distance from one another at which they could keep fairly warm and at the same time escape hurt. So it is with man in society. He finds it difficult to harmonise with others, and yet if he went "on his own" his life would be "nasty, brutish, and short," to quote Hobbes's phrase, and so coöperation to a certain extent is forced upon him.

That, of course, is not a very close analogy, because society is not a matter of deliberate social contract, but has grown in relation to the needs of individuals, and individuals have never existed by themselves, but always within some system or family, and thus their social instincts and their ego instincts have developed *pari passu*. We cannot deduce the social behaviour of man from his purely individual behaviour, and, in fact, there is no such thing as purely individual behaviour because man is always acting as a member of some group and generally as a member of a number of groups simultaneously. It is not that psychology deals with the individual man while sociology and anthropology and other sciences deal with his social relations. At every point the individual is reacting to the society to which he belongs.

A purely economic theory of the cause of war might have a corresponding psychological theory, very simple, and therefore inadequate—namely, that man gets annoyed when his interests are threatened, irritated when his will to live is thwarted, economic difficulties make him angry, and when his misfortunes and the reason for them are declared to him by some demagogue he may in his irritated state become pugnacious and ready to fight. That theory is simple, as I have said, but very inadequate, because it takes practically no account of the structure of the mind. The individual mind has developed through countless generations from the most primitive condition with reference to a very real struggle for existence. We must accept in its general outline the Darwinian theory of natural selection and the survival of the fittest, for the mind as for the body. But although the mind has developed to a certain degree and it is possible for coöperation to supplement competition, and for man to become more and more coöperative and less and less competitive, nevertheless he still carries with him tendencies towards more primitive forms of mental reaction such as were appropriate to the early stages of national and social evolution, but are not so obviously appropriate now.

Primitive Urges

We observe this very clearly in criminal behaviour. A great deal of such behaviour is a relapse or a regression to a more primitive reaction of the organism. The murderer is not always someone whose reactions to life have been perverted, but often someone who, through disease of the nervous system or developmental degeneration, perhaps transmitted from parent to child, resulting in weakness of mental and nervous control, reacts as his primitive ancestors

* A paper read at the inaugural session of the Fourth Biennial Conference on Mental Health held in the Central Hall, Westminster, on Jan. 23rd, 1936.

ages ago reacted in an environment where such reactions would be accounted normal. He wants a man's watch, and the most direct method is to kill the owner. He yearns for the taste of roast pig, and so he burns down the house. Many of these severe cases of criminality resist every type of treatment, punitive or reformatory, because they are themselves primitive in this particular direction. In some ways they are a reversion to type, a "throw back" to a much earlier level of evolution.

All this means that civilised man, the modern *Homo sapiens*, carries with him possibilities of behaviour that are appropriate to the earlier stages of mental development, but are customarily held in check or superseded by more developed methods of reaction. On analysis one finds that most people who are regarded as normal still retain far down in their unconscious mind—that is, on the primitive levels of mentality—tendencies that were appropriate in the early stages of human development but are no longer allowed to be dominant.

One of these primitive tendencies is that of self-preservation, present in all of us, but held in check by higher considerations; in part such urges have been not destroyed or neutralised, but directed in the course of evolution to higher social and cultural ends. But a good deal of the old urge remains at its most primitive levels, even in the most highly developed man, so that in certain conditions of great danger, especially when accompanied by ignorance of what exactly is happening, the urge for self-preservation may leap forward with overwhelming force, and he may take refuge in panic-stricken flight, to his own great disgust afterwards. It is the same with the urge not only to preserve our lives but to assert ourselves, to extend and enlarge our powers. This again may be held in check by various mental mechanisms of later development, by the grace of modesty, by self-criticism, by consideration for others, by a regard for what is decent, even by a sense of proportion in things, and, which follows from it, a sense of humour; yet nevertheless, deep down in the mind, some of this self-assertive tendency remains, and given the occasion may blaze out very much in its original form. This, again, can happen in the most highly developed of men.

One of the many occasions when these primitive tendencies can show themselves uncensored and unreproved is in a great mass movement where the individual feels the safety and security of the crowd around him, all thinking in the same way, and his sense of responsibility to himself is greatly lightened. He does not deliberately give way to more primitive tendencies, but those primitive tendencies are always ready to come forward and manifest themselves through more complicated civilised behaviour. They are like a charge of electricity suddenly short-circuiting a delicate installation, overcoming all resistances, and lighting the landscape with a lurid flame. Thus a crowd may fall into a panic and in such a state take the slightest occasion for action utterly out of proportion to the circumstances. It may when aroused spring savagely like a tiger without reck or consideration even for its own safety. Yet in that crowd, moved by the same impulses and intent on the same wild course, may be men who individually would never dream of acting in that way. That situation was recognised long before any analytic work had been done upon the mind. The crowds of the French Revolution, for example, and the excesses which they committed were the subject long ago of psychological study.

Mass Psychology

The possibility of mass mental reactions or mass psychoses has an obvious bearing upon the problem of war and peace, but the deeper analysis of the mind in recent times inaugurated by Sigmund Freud has shown to how great an extent mental forces can continue to manifest themselves in an unconscious form, even while the conscious mind is fully alert and apparently in full control. All these forces that

come up so obviously in mass movements are working also in the individual mind and showing themselves in distorted forms. Even mental reactions that the majority of people would recognise as perfectly normal and appropriate to the circumstances can by analysis be traced back to still more primitive tendencies from which they derive their energy. It is as if a person who belonged to a wealthy family used the leisure that his inherited wealth made possible to become highly cultured, deeply read, artistically appreciative, while yet the money which enabled him to do this came from the labour of many of his own species, hewing minerals from the bowels of the earth at great toil and risk and with little reward. The example that springs to the mind is that of Greek culture during the golden age in Athens, a culture which was, of course, founded upon slavery. Slavery was justified even by Aristotle. The arguments are familiar, they are biased, and can be used in different ways to point to different conclusions. I am using it here only as an analogy, and indeed as an analogy it does not completely hold, because the forces in the unconscious in our highly developed cultural life are not in themselves good or bad, they just represent biological or mental energy.

Among them are these primitive forces of self-preservation and self-assertion. Both in their measure are needed. Unless we are able to preserve our lives we shall do no good to anyone. Self-assertion, too, is obviously good in a general sense, though it can be directed in such a way as to be a curse to everyone concerned. It is all a matter of direction, and in the cultured life it is directed adequately. With that cultured outlook on life these fundamental forces have to be kept at bay, under control, used as the powers of nature are used in an industrial civilisation. Used in a different way they may result in institutions and forms of thought which are irreconcilable with ultimate peace between individuals or between nations. It comes to this, that he who wills the means wills the end. A certain outlook on life, a certain direction or misdirection of the internal forces may involve ultimately such a conflict as can only be settled by an appeal to force.

The Rule of Law

It is often said that war could be prevented in the same way as duelling has been prevented, by legal process. Might not the appeal to force as between nation and nation be brought to an end if it were declared illegal? But it must be remembered that a law, although ultimately it may be in harmony with the moral outlook of the great majority of individuals, needs force to sustain it. In separate communities it is sustained by police. An international law binding the nations would need to be supported by force at the present stage of human evolution. From a psychological point of view it seems to me an obvious implication that we need a supernational institution with adequate force at its disposal to support the decisions of international law. That is not within the bounds of practical politics at the present time. No nation would surrender its sovereignty to a super-state. Such quixotism is not to be found now upon the earth. The only alternative to this—I do not want to lecture on the subject, but to consider it only in relation to psychology—is a *pis aller* or second best, a system of collective security through the League of Nations.

For that to be really successful it should be universal. The League of Nations must include the whole world, because peace is a matter which affects the whole world, especially in view of the rapidly extending lines of communication and the physical, economic, and cultural contacts of all countries. A true League of Nations must include every nation, and then the principle of collective security may be capable of being maintained and the primitive passions of separate nations held in leash. But as things are at present there is no immediate prospect of a complete League, and to the extent to which it is incomplete, psychologically speaking—and again

I am not speaking as a politician—its prospects of success are greatly diminished. It is even a question whether, in such a situation, it is not better to recognise the difficulties, and seeing that there is not an adequate force at the disposal of the League to impose its decisions, to keep those decisions as expressions of moral opinion, otherwise the League may involve more fighting and not less. But the more courageous way is to organise economic (as distinct from military) sanctions to the utmost of which the nations now members of the League are capable, and thus to bring *forcibly* home to an aggressor the collective moral disapprobation of his aggression.

Mobilisation of the Unconscious

It may be asked how it is possible for any individual who has enjoyed the benefits of modern culture and has acquired self-control to be brought to such a state of mind that he can kill another with whom he has no personal quarrel. In the quiet and even friendly atmosphere of the laboratory a man may, in his scientific enthusiasm, concern himself with aeroplanes and armament of various kinds, forgetting the use to which they are to be put; but how is it possible for him to fire the guns, explode the munitions, drop the bombs, release the poison gas, knowing that the result will be the killing and maiming of his fellow-creatures? In other words, how is it possible for anyone to take part in war? That is a psychological problem which each of us must put to himself. In the last war there were a number of people who refused to have anything to do with it. They were all classed together as conscientious objectors, though in fact the motives behind their refusal differed along a wide range. In fact, they had only this in common, a strongly individualistic turn of mind, and indeed it needed to be strong to withstand the tremendous mass suggestion which was surging around them.

But the great majority of people were swept along on the wave of popular feeling, and, I suppose, in the circumstances of 1914 as they presented themselves to the normal mind at that time, with all that people learned or were told of the events preceding the outbreak and those of the first months of the war, active participation in or support of the war seemed to be called for by the reason and conscience of the individual as well as by the authorities of the State. The unconscious was being mobilised at the same time as the mobilisation of the army and navy.

Nevertheless, I think it may be stated that if the individual man was fully aware of all the unconscious forces at work his participation in war would at any rate be more hesitating, his mind more a prey to misgiving. Here let me say I am not approaching the subject of participation or non-participation from the point of view of ethics or religious conviction. Those are the ultimate court of appeal, but we are not dealing with them at the moment. It is purely a question of the facts at our disposal and appropriate action on them. My contention is that we have not all the psychological facts at our disposal when we endeavour to sum up this question of our duty. If the psychological panorama were cleared of the smoke screen we should not at all events have that terrible contradiction whereby opposing peoples take up arms against one another to the glory of God, each appealing to Him for victory.

Forces on Leash

All this, I know, is a platitude, but it has to be mentioned in order that we may face up to the psychological problem. The unconscious urges which are demanding satisfaction have to be remembered. These are not just skeletons in the cupboard, they are very live and potent forces. The tiger is there, and the wolf, and the jackal, and the snake, and we must not forget the donkey. These are at all ordinary times held in check by our conscious aims and purposes, and in general by our culture, our

sense of what is due to others and admirable in ourselves. But the working of these unconscious forces can distort our moral judgment, so that for example during the last war we had quite kindly and well-educated people uttering such sentiments as that "the only good German is a dead German," though this became less pronounced as the war went on and weariness and disillusionment developed. We have to ask ourselves the question, what strange mentality settled upon them that they could deny all that culture and social contacts had brought them and be as bloodthirsty as their primeval ancestors? It is true that the Germans had invaded Belgium; that and other things were fuel for the eager fire. Behind it all was the deep conviction that a man must be ready to fight for his king and country and to preserve the life and honour of his own.

Those were the motives on the surface, and it is true that once war had begun there was a certain responsibility upon the shoulders of everyone to see that it was prosecuted with the utmost efficiency.

"Theirs not to reason why,
Theirs but to do and die"—

and this they did, acting according to whatever plans were devised by the higher command. The whole nation was working as a nation on the principle of self-preservation. The individual was drawn up into the national life in a way which certainly that generation had never known before. His unconscious had the texture of the unconscious of all the other members of the nation.

The same thing happens in times of revolution. The leader, so called, at such times is really the man who stands for the unconscious of all the people whom he leads. People have the leaders they deserve or demand. The leader is the man who satisfies not only their conscious demands but their unconscious urges. But that is a thing which is always overlooked and will continue to be overlooked by the mass of educated people for a long time to come.

Propaganda and Proper Geese

It is seen fairly clearly now that if peace is eventually to be achieved economic science must give of its best, and what it gives must be acted upon; but it is not seen with equal clearness that psychological science must also give of its best, and that what it gives must be acted upon. Up to now there has been a good deal of perverted use of psychology in relation to war and peace—I refer to its use in connexion with propaganda. As soon as war breaks out no doubt it is morally right to use propaganda on each side to the utmost extent. It is the propaganda that takes place before war that is so devilish. By propaganda I mean here, to use a simple word, lying, the distortion of facts. Such propaganda is successful enough, given the proper geese, the people ready to accept the lies or the false emphasis. Propaganda for ulterior motives makes it difficult even for the best educated individual to arrive at the facts. He seeks for them and does not get them, whatever newspaper he takes. One of the great needs of the world is for complete truthfulness, but lying and chicanery are part of the very art of war.

As an illustration of how psychological motives in war may work, in another country it was said that in the last war they had been brought in to support financial interests, the interests of people who had invested heavily and risked a great deal of wealth in support of other nations engaged in that war. I am not saying that that was true, but only that if it were true we should have a primitive motive—namely, the desire for gain, or the desire to escape financial ruin—supporting and energising more lofty moral considerations.

But if it is possible, as indeed it is, on the fully conscious plane to have deliberate mis-statements and misdirection and deception and appeal to prejudice, and fixed ideas about the duty to fight, and the slogan "My country right or wrong,"—if

that is possible on the purely conscious level, how much more danger must there be in appeals directed to unconscious forces in the mind? I have spoken already of the instinct of self-assertion. The desire for power and prestige goes hand in hand with the sense of the importance of one's family, or college, or country, and so from the depths of the unconscious there is a continuous line or channel of energetic mental development. Such self-assertion can be very rigid and intractable. It can be distorted in all sorts of ways and disguised in scarcely recognised forms. One of the most overwhelmingly successful ways of disguising it from ourselves is to moralise it, to say that we have a duty to this, that, or the other, and to let that sense of duty reinforce what is, when uncovered, the working instinct of self-assertion or desire for power of a ruthless kind—ruthless, I say, because it arises from some primitive state where the individual neither knew nor received pity.

Aggression pure and simple in the unconscious is a primeval factor, the kind of thing that enables the soldier to kill his enemy when he "sees red." The word "sheep" has sometimes been applied to the soldier type of mind, but there is something much more positive than that about it. I am well aware, of course, that what I am saying is incomplete. On the other side there is the desire, equally fundamental, for fellowship, for love. It is from the refusal of love that a great deal of aggression springs. The little child wants to be loved and is ready to love, but if it does not receive love from its parents it is likely to become an intractable child, hostile and aggressive. Such aggressiveness is not primitive, it is secondary to the denial of love.

I feel that it is the same between nations. One nation wishes the friendship of another; it would rather be the ally of the other than its enemy. But if its overtures are rejected a revulsion of feeling may take place such as that which overwhelms the scorned lover. There is thus a primary aggressiveness which comes out in battle and murder, but there is also a secondary aggressiveness which is very much more widespread and can manifest itself in its own way. There is the further danger in the situation that the primitive tendency to self-sacrifice, to injure oneself, may, when linked up with the ideal of national duty, supply a new fund of energy, and thus bring about war or keep a war going after it has broken out, and the cunning propagandist realises this and appeals to that very sentiment.

All these are factors which provoke and sustain war. I hope I have made it clear in the compass of a short address how much dangerous and explosive material there is which will have to be dealt with and cleared out of the way before peace can be ensured. It is rightly said that moral disarmament must precede material disarmament, but even before moral disarmament there must be a psychological assessment not only of those "inward parts" which, on the highest of all authority, may be "full of ravaging and wickedness," but also of still more deep-seated or primitive mental tendencies that in themselves are neither moral nor immoral.

NEW PREPARATIONS

MULTIVITE PELLETS.—In presenting their new chocolate-covered pellets, containing vitamins A, B₁, B₂, C, and D, the British Drug Houses Ltd. (London, N.1) quote a statement that "the interest which vitamins hold for the physician is not alone in their relation to certain well defined diseases . . . but rather in the fact that chronic vitamin deficiency produces numerous vague, borderline states of ill-health which often puzzle the physician and disable the patient." It is impossible, they say, to ensure that the normal daily dietary under modern conditions is rich in the necessary vitamins, and they mention anorexia, gastric distension, constipation, nervous disorders, dental decay, certain forms of

anæmia, and a feeling of being "out of sorts" as possible consequences of slight but general vitamin deficiency. Multivite Pellets have been made in response to a demand for a well-balanced vitamin concentrate which would be acceptable to adults and convenient for use in private practice and among hospital patients and out-patients. Each contains vitamin A 3000 international units, vitamin C 100, and vitamin D 600, with vitamin-B complex equivalent to 2.0 grammes of distillers' yeast. The suggested dose is for children 1-2 pellets daily and for adults 2-4. Samples are obtainable on application.

HEWSOL is described as a non-poisonous, non-corrosive germicide consisting of a pine oil treated by a special process and combined with a neutral soap so as to give a perfect emulsion when mixed with tap-water in the proportions recommended. It may be used undiluted on dressings applied to wounds, but as a general lotion 5-8 per cent. solutions are suitable. Apart from abrasions and cuts it may be used for douches, baths, and disinfectant sprays and for washing contaminated linen; its destructive action on cultures of *Bacillus typhosus* (Rideal-Walker coefficient) is stated to be five times that of carbolic acid. The proprietors, Messrs. C. J. Hewlett and Son, Ltd. (35, Charlotte-street, London, E.C.2), claim in addition that Hewsol is non-staining, non-irritating, free from cresol and xylene derivatives, and economical in use. It has a pleasant smell.

USES of ACRIFLAVINE.—The Boots Pure Drug Company Ltd. (Nottingham) have issued an interesting booklet describing the properties and many uses of the acridine antiseptics, with special reference to the Boots preparations of acriflavine, neutral acriflavine (euflavine), Acriflavine Emulsion, Burnol Acriflavine Cream, and proflavine. An enclosure is devoted to the use of acriflavine derivatives in gonorrhœa, where they are not only employed for local irrigation but also—with reservations—administered by mouth or by injection. Acriflavine Emulsion is recommended particularly as a dressing for wounds, septic conditions, burns and scalds, and ophthalmic inflammation or injuries.

SALICIN.—This drug, a glucoside obtained from willows and poplars, introduced as an anti-rheumatic in 1874, has suffered partial eclipse by sodium salicylate and allied compounds. To show that this eclipse is undeserved the three manufacturers in Great Britain (J. F. Macfarlan and Co., 32, Bethnal Green-road, London, E.1; T. and H. Smith Ltd.; and Whiffen and Sons, Ltd.) have prepared a statement of the value of salicin in medical practice and offer to supply samples of powder or tablets. They claim that it has none of the depressing or irritant effects of salicylates and that clinical experience has proved its usefulness in the treatment of influenza and rheumatism, and also of psoriasis and other skin diseases.

THE ALFRED EICHHOLZ CLINIC

THE Alfred Eichholz Clinic, 204/206, Great Portland-street, London, W.1, has issued a further edition of its handy scribbling pads, on the covers of which are depicted scenes from medical history. The latest is a reproduction from the well-known picture in Barber Surgeons-Hall, of Sir Charles Scarborough, first physician to Charles II., James II., and William III., and Edward Arris, serjeant-surgeon to Charles II.

NORTH HERTFORDSHIRE AND SOUTH BEDFORDSHIRE HOSPITAL, HITCHIN.—The Duchess of Gloucester opened a new men's ward and a new children's ward at this institution on Jan. 17th. The extensions cost £15,000 and are the first completed part of a £35,000 scheme. Nearly £900 in purses was presented to the Duchess. The children's ward is to be known as the Gloucester ward.

Vacancies

For further information refer to the advertisement columns

Aldrich Blake Travelling Scholarship.—200 guineas.
Ashton-under-Lyne District Infirmary.—H.S. At rate of £150.
Barbados General Hospital.—Sen. Res. Surg. £150.
Bath, Royal United Hospital.—H.S. At rate of £150. Also Hon. Med. Reg.
Beckenham, Bethlem Royal Hospital, Monks Orchard.—Jun. Asst. Phys. £350.
Bexley Urban District Council.—M.O.H. £800.
Birmingham City, Maternity and Child Welfare Dept.—Temp. M.O. £10 per week.
Birmingham Maternity Hospital.—Res. M.O. and Reg. £200.
Birmingham, Queen's Hospital.—Bacteriologist and Clin. Pathologist. £600. Also Res. Surg. Reg. £100.
Blackburn Royal Infirmary.—Res. Surg. O. £250. Also H.S. £175.
Bradford Royal Infirmary.—H.S. At rate of £135.
Bruton Clinic for Rheumatism and Allied Diseases.—H.P. At rate of £200.
Cambridge, Papworth Village Settlement.—H.P. £200.
Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.
Canterbury, Kent and Canterbury Hospital.—H.P. At rate of £125.
Colchester, Royal Eastern Counties' Institution for the Mentally Defective.—Asst. M.O. £350.
Cowenry and Warwickshire Hospital.—Res. Cas. O. £125.
Deusbury and District General Infirmary.—Sen. H.S. £200.
Doncaster Royal Infirmary.—H.S. to Eye and Ear, Nose, and Throat Depts. £175.
Downpatrick, Down Mental Hospital.—Jun. Asst. M.O. £300.
Dutwich Hospital, S.E.—H.P. At rate of £120.
East Ham Memorial Hospital, Shrewsbury-road, E.—H.P. At rate of £150.
Edmonton, North Middlesex County Hospital.—Jun. Res. Asst. M.O. At rate of £250.
Egyptian Government.—Director of Lunacy Division in P.H. Dept. L.E. 1020 to L.E. 1200.
Hull City Hospital for Infectious Diseases, Cottingham.—Res. M.O. £350.
Hull Royal Infirmary.—Second Cas. O. At rate of £150.
Infants Hospital, Vincent-square, Westminster.—Res. M.O. £300. Also two Physicians to Out-Patient Dept.
Lambeth Hospital, Brook-street, S.E.—Asst. M.O. £350.
Leeds General Infirmary.—Hon. Asst. Phys. £1000.
Leeds University.—Chair of Physiology. £1000.
Liverpool Hospital for Consumption and Diseases of the Chest.—Res. M.O. £150.
London Hospital, E.—Medical 1st Asst. and Reg. £300.
London Lock Hospital, Harrow-road, W.—Surg. Reg. to Dean-street Male Lock Hospital. £100.
Middlesbrough County Borough.—M.O.H. £1100.
Middlesex Hospital, W.—Fracture and Orthopaedic Registrar. £300.
Mill End Hospital, Bancroft-road, E.—Asst. M.O. £350.
Newcastle-upon-Tyne, Hospital for Sick Children.—Res. Surg. O. £250.
Northampton County Mental Hospital, Berrywood.—Second Asst. M.O. £450.
Nottingham Children's Hospital.—Res. H.S. At rate of £150.
Nottingham General Hospital.—Cas. O. At rate of £150.
Paddington Hospital, Harrow-road, W.—Asst. M.O. £350.
Perth Royal Infirmary.—Sen. H.S. £250.
Portsmouth City.—Visiting Consultant Obstetrician. £200.
Preston, Sharoe Green Hospital.—Sen. Asst. Res. M.O. Also Jun. Asst. Res. M.O. At rate of £200 and £100 respectively.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Res. Anaesthetist. At rate of £100. Res. Anaesthetist and Dist. Res. M.O. At rate of £90. Also Asst. Res. M.O. At rate of £80.
Queen's Hospital for Children, Hackney-road, E.—Res. M.O. At rate of £200. Also H.S. and Cas. O. Each at rate of £100.
Romford, Oldchurch Hospital.—Asst. Res. Radiologist and Jun. Res. M.O. Each £250. Also General Consulting Phys. £300.
Royal National Orthopaedic Hospital, 234, Great Portland-street, W.—Asst. Res. Surg. for Country Branch. £250.
Royal Naval Medical Service.—Eight vacancies.
Royal Northern Hospital, Holloway, N.—H.P. Also Obstet. H.S. Each at rate of £70.
St. Alfege's Hospital, Vanbrugh Hill, S.E.—Asst. M.O. £350.
St. Andrew's, Devons-road, E.—H.P. At rate of £120.
St. George-in-the-East Hospital, Raine-street.—Asst. M.O. £350.
St. John's Hospital, Lewisham, S.E.—Med. Reg. to Out-patients. 50 guineas.
St. Leonards-on-Sea, Buchanan Hospital.—Hon. Surgeon.
St. Peter's Hospital, Vallance-road, E.—Asst. M.O. £350.
Sheffield Children's Hospital.—H.S. At rate of £100.
Sheffield Royal Hospital.—Clin. Asst. to Ophthalmic Dept. Also Clin. Asst. to Ear, Nose, and Throat Dept. Each £300.
Shrewsbury, Royal Salop Infirmary.—Res. H.S. At rate of £160.
Shrewsbury, Salop Mental Hospital.—Asst. M.O. £350.
Stockport Infirmary.—H.S. and Cas. O. £150.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S. At rate of £150.
Waltham Abbey, Board's Isolation Hospital.—Res. M.O. £650.
West London Hospital, Hammersmith-road, W.—Half-time Pathologist. At rate of £300.
West Riding of Yorkshire County Council.—School Medical Inspector. £500.
Winchester, Royal Hampshire County Hospital.—Asst. Hon. Clin. Pathologist.
Windsor, King Edward VII. Hospital.—Hon. Asst. Surg.
Woolwich and District War Memorial Hospital, Shooters Hill, S.E.—H.P. At rate of £100.

Births, Marriages, and Deaths

BIRTHS

BRADY-BIRKS.—On Jan. 26th, at the City of London Maternity Hospital, Hilda Kathleen Brady-Birks, M.Sc., M.B. Manch., wife of the Rev. S. Graham Brady-Birks, D.Sc., of Godmersham, Canterbury, of a daughter.
DUFFETT.—On Jan. 20th, at Plymouth, the wife of Edward C. Duffett, M.R.C.S. Eng., of a son.
GARLAND.—On Jan. 23rd, at Leeds, wife of Dr. Hugh Garland, of a daughter.
HADLEY.—On Jan. 16th, the wife of John A. Hadley, F.R.C.S. Edin., of Lincoln, of a son.
MORRISON.—On Jan. 17th, at Leeds, the wife of Dr. J. Morrison, Halifax, of a son.
ROWLANDS.—On Jan. 26th, at Wimpole-street, W., the wife of Dr. John Rowlands, of a son.
SANDELL.—On Jan. 23rd, at Wilbraham-place, S.W., the wife of David H. Sandell, M.D., F.R.C.S. Eng., of a daughter.
WHITTLE.—On Jan. 23rd, 1936, at Brookfield, Cambridge, to Phyllis (née Fricker), wife of Dr. C. Howard Whittle—a son.

MARRIAGES

DALRYMPLE SMITH—RILEY.—On Jan. 23rd, at St. Joseph's, Richmond, Yorkshire, Angus Dalrymple Smith, M.B., F.R.C.S. Edin., to Rowena, younger daughter of Mr. Herbert Riley, of Richmond, Yorks.
PASMORE—CALMAN.—On Jan. 22nd, at Kingston Vale, Dr. Stephen Pasmore to Dr. Jean Calman, daughter of W. T. Calman, C.B., D.Sc., F.R.S., and Mrs. Calman, M.B.
SANDEMAN—CUNNINGHAM.—On Jan. 22nd, at Perth, Charles Stewart Sandeman, M.B., Ch.B. Edin., to Eva Margaret, daughter of the late James Cunningham and Mrs. Cunningham, St. Andrews.

DEATHS

BLAIR-BELL.—On Jan. 25th, Prof. William Blair-Bell, M.D. Lond., F.R.C.S. Eng., F.C.O.G., West Felton, Shropshire, aged 64.
BROOKE.—On Jan. 15th, at Singapore, Gilbert Edward Brooke, L.R.C.P. Edin.
COLQUHOUN.—On Jan. 23rd, at a nursing-home, William Brooks Colquhoun, M.R.C.S. Eng., aged 76.
GWYNN.—On Jan. 20th, at Brighton, Edward Betton Gwynn, M.B. Edin., eldest son of the late Samuel Betton Gwynn, F.R.C.S. Eng., L.R.C.P., of Wem, Shropshire.
HARRISON.—On Jan. 24th, suddenly, at Worthing, Henry Leeds Harrison, M.B. Camb.
JONES.—On Jan. 20th, at St. Clears, South Wales, Valentine Llewellyn Watson Jones, M.R.C.S. Eng., in his 83rd year.
MAXWELL.—On Jan. 24th, at Yeomans, Wrington, Somerset, Herbert Bowen Maxwell, M.R.C.S. Eng.
MORRIS.—On Jan. 23rd, at Harrogate, Richard John Morris, C.B.E., M.D. Durh., aged 75.
SHEPPARD.—On Jan. 22nd, at Crockham Hill, near Edenbridge, Kent, Amy Sheppard, O.B.E., M.B. Lond., D.P.H. Camb., late of Harley-street, W.
N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE FOTHERGILL TESTIMONIAL FUND

THE following is the first list of subscriptions received in response to the letter published in the *British Medical Journal* and *The Lancet* of Jan. 18th

Helen Boyle (Hove), £50; Alfred Cox (London) and Donald Hall (Hove), each £20; A. C. Gemmill (Hove), £5; Donald Hall (Hove), second subscription, £10 10s.; Sir Ewen Maclean (Cardiff), C. E. S. Flemming (Bradford-on-Avon), A. H. Burgess (Manchester), W. McAdam Eccles (London), and J. W. Bone (Luton), each £5 5s.; H. G. Dain (Birmingham), £3 3s.; J. D'Ewart (Manchester), £1; G. Saunders (Kew), £1 1s.; W. E. Thomas (Ystrad Rhondda), £5 5s.; R. Whittington (Hove), 10s. 6d.; Sir Henry Brackenbury (Hendon), £5 5s.; P. Macdonald (York), £5; F. C. B. Gittings (Southsea), £1 1s.; E. M. Glynn (Whitby) (Liverpool), £2 2s.; H. M. Galt (Jersey), D. G. Greenfield (Rushden), A. T. Ross (Mevagissey), and N. E. Waterfield (Great Bookham), each £1 1s.; F. Radcliffe (Dedham), A. Forbes (Shelfield), and J. Hudson (Newcastle-upon-Tyne), each £2 2s.; P. B. Spurgin (London), £1 1s.; H. N. Fletcher (Hove), £10 10s.; G. C. Anderson (London), £3 3s.; Sir Farquhar Buzzard (Oxford), £5; R. C. Buist (Dundee), £5 5s.; A. Lyndon (Hindhead), and E. A. Starling (Tunbridge), each £1 1s.; Prof. J. W. Biggar (Dublin), £3 3s.; C. Gibson (Worthing), £1 1s.; Lancashire Local Medical and Panel Committee, £52 10s.; N. Bishop Harman (London), £5 5s.; S. A. Winstanley (Urmston), £1 1s.; and N. G. Horner (London), £3 3s. Total £262 14s. 6d.

Cheques should be made payable to the Fothergill Testimonial Fund, and addressed to the Treasurer, Fothergill Testimonial Fund, British Medical Association, B.M.A. House, Tavistock-square, London, W.C.1.

ADDRESSES AND ORIGINAL ARTICLES

MATERNAL MORTALITY IN HOSPITAL

A REVIEW OF 999 FATAL CASES IN THE GLASGOW ROYAL MATERNITY AND WOMEN'S HOSPITAL DURING TEN YEARS, 1925-34 *

By DUGALD BAIRD, B.Sc., M.D. Glasg., F.C.O.G.
VISITING OBSTETRIC SURGEON, GLASGOW ROYAL MATERNITY HOSPITAL

THIS investigation has been undertaken to test the impression that, although the maternal mortality for Scotland generally continues to rise, the death-rate in hospital is steadily falling. In 1930 big changes were made in the organisation of the Glasgow Royal Maternity Hospital and the staff was greatly increased. The results recorded in the five-year periods before and after these changes are here compared.

During the first five-year period, 19,134 cases were admitted with 542 deaths (28 per 1000), while during the second five-year period, 22,425 cases were admitted with 457 deaths (20 per 1000). There has therefore been a considerable fall in the death-rate during the last five years, despite the fact that the percentage of abnormal cases has risen from 62 to 65. Table I. contrasts the numbers and death-rates of some of the complications dealt with during the two periods.

TABLE I

Numbers and Death-rates of Complications during the Two Periods

Condition.	First five years.		Second five years.		Difference between first and second five years.
	No. of cases.	Mortality per cent.	No. of cases.	Mortality per cent.	
Hyperemesis ..	255	12.1	382	4.4	+127
Albuminuria ..	1162	2.7	1397	1.5	+235
Eclampsia ..	395	18.0	330	17.6	-65
Forceps, &c. ..	1260	4.3	1810	3.3	+550
Cæsarean section for contracted pelvis ..	424	3.0	699	2.0	+275
Failed forceps outside	190	16.3	236	13.1	+46
Craniotomy ..	226	11.0	147	7.5	-79
Abortion ..	3290	1.2	3219	0.6	-71
Placenta previa ..	406	13.0	487	7.5	+81
Accidental hæmorrhage ..	527	4.5	633	5.0	+106
Cardiac disease ..	345	10.4	606	6.4	+261

For further analysis the fatal cases have been grouped according to the condition for which the patient was admitted to hospital—unless she was admitted in labour or for some complication of labour, in which case they have been classified according to the cause of death.

TABLE II

Analysis of Fatal Cases

	1925-29.	1930-34.
Toxæmia ..	159	118
Sepsis ..	139	98
Shock ..	58	56
Hæmorrhage ..	104	107
Intercurrent disease ..	82	78

The comparison shows a notable fall in the number of deaths from toxæmia and sepsis in the second

five years, and this is in direct contrast to the finding of the Department of Health for Scotland, in their 1935 report, that the death-rate from those two causes is on the increase. Each group will now be dealt with in detail.

TOXÆMIA

Eclampsia.—During the first five years there were 395 cases of eclampsia with 71 deaths (18 per cent. mortality), and in the second five years 330 cases with 58 deaths (17.6 per cent. mortality). Hence there has been no striking improvement in the results of treatment of eclampsia, and we must look to prevention by strict antenatal care to reduce the incidence. In the first five-year period very little is known about the antenatal care received by the fatal cases. We do know, however, that 8 of them were being treated in the antenatal wards of the hospital for albuminuria. We know that in the second five years 40 per cent. of the cases had antenatal care, and in most of the others the antenatal supervision was poor. There were no deaths from eclampsia in this second period among women being treated in the antenatal wards of the hospital, but 7 of the fatal cases attended the out-patient department of the hospital and were later admitted with eclampsia. These 7 cases all occurred before the end of 1932, since when the antenatal supervision has been stricter and the importance of the fact that raised blood pressure may be the only pre-monitory symptom of toxæmia has been realised. In the years 1933 and 1934 there have been no fatal cases of eclampsia in patients under hospital supervision. This suggests that death from eclampsia can be avoided by intensive antenatal care. The following figures show, however, that eclamptic seizures still occur in patients under hospital treatment. During the years 1934 and 1935, 46 cases of eclampsia were admitted to one unit of the hospital, 7 of which were under hospital supervision. There were 6 deaths among 35 patients who had poor antenatal care or none (17.1 per cent. mortality), none in the hospital cases, and none in 4 who had good antenatal care outside. One of the hospital cases may be quoted.

Mrs. A., aged 22; first pregnancy, last menstrual period March 24th, 1934. On Dec. 24th she was sent to the out-patient department of the Maternity Hospital from a local authority clinic because of slight œdema and headache of two weeks' duration. Blood pressure 160/108; urine clear. Hospital treatment was refused, but on Dec. 31st she was admitted to hospital after persuasion; B.P. 168/110. Jan. 3rd, 1935: urine clear; very slight œdema; B.P. 154/108; urinary output good. As patient was at term castor oil and quinine given. Jan. 4th: labour pains began at 7 P.M.; urine clear at 8 P.M.; eclamptic seizure at 11 P.M., with B.P. 156/82 and a cloud of albumin in the urine. Jan. 5th, 11 A.M.: 14 fits to date; forceps delivery under local anæsthesia; child 7 lb. stillborn. Uninterrupted recovery; urine clear on the third day.

This case is a striking demonstration of the fact that raised blood pressure is one of the most reliable pre-eclamptic signs, and may be present long before there is any albumin in the urine. There was no albuminuria in this case three hours before the onset of eclampsia.

In conclusion, it would appear that strict antenatal care can reduce the incidence of eclampsia and also its severity; for when eclampsia develops, despite good antenatal care, it seems to take the

* The substance of this paper was read before the Glasgow Obstetrical Society on Jan. 22nd. 5867

form of seizures brought on by the stress of labour, with rapid recovery in the puerperium.

Albuminuria.—In 1162 patients treated in the antenatal wards for albuminuria during the first five-year period there were 40 deaths (3·4 per cent.), and in 1397 patients during the second period 22 deaths (1·5 per cent.). This includes the 8 deaths from eclampsia which occurred in the first five-year period, already dealt with above. The improvement in the death-rate in the second five years is not due to any striking advance in treatment but to earlier admission to hospital and earlier termination of the pregnancy with improved methods of induction of labour. During the first five years valuable time was frequently lost by attempting medical induction, which was often unsuccessful and necessitated the use of bougies which often had to be reinserted several times before labour began. Bougies are now seldom used and have been replaced by rupture of the membranes, which has many advantages. It induces labour more quickly, does not require a general anæsthetic, and is less liable to be followed by sepsis. Although surgical induction was practised 268 times in the second five years and only 130 times in the first, there were only 3 deaths from sepsis in the second period as compared with 10 in the first. Of these 13 deaths 8 occurred after the use of bougies and 1 after rupture of the membranes. The gross liver damage demonstrable histologically in many of those toxæmic cases emphasises the unsuitability of a general anæsthetic, and especially chloroform, which was the anæsthetic used for the insertion of bougies. In 10 of the 54 cases with fatal albuminuria, the obstetric history showed quite clearly that the patient was quite unfit for pregnancy, which should have been prevented.

Hyperemesis (vomiting in the early months of pregnancy).—The number of cases of hyperemesis admitted to hospital has increased from 255 in the first five-year period to 382 in the second, while the death-rate has fallen from 12·1 per cent. to 4·4 per cent. As with albuminuria, there has been no striking improvement in the method of treatment in hospital, and the improvement in the death-rate is due to earlier termination of the pregnancy by better methods. There should be almost no deaths from hyperemesis, and this could be achieved by earlier admission to hospital. In the second five years, 11 of the 17 deaths from hyperemesis were in patients so ill on admission that they died within four days. The improved technique for termination of pregnancy in cases of hyperemesis, reflected in the fall in the number of deaths from shock from 13 to 3, consists of the substitution of spinal anæsthesia or gas-and-oxygen for chloroform, and of abdominal hysterotomy in many cases for curettage, preceded by dilatation of the cervix by laminaria tents or forcibly with Hegar's dilators.

Toxic vomiting in the later months.—This category includes cases of toxæmia in the later months where there is no rise of blood pressure, œdema, or albuminuria, the chief symptom being vomiting. In the first five years there were 15 deaths, 10 occurring soon after admission in severely ill patients, and in the second five years 9 deaths, all soon after admission in severely ill patients. Apparently, therefore, the mortality could be reduced by earlier admission to hospital.

Pyelitis of pregnancy is included with the toxæmias for convenience. In the first five years there were 10 deaths and in the second five years 11. As microscopic examination of a catheter specimen of urine was not a routine practice in all patients admitted to the antenatal wards during the first five years, the exact number of cases of

pyelitis admitted during this period is unknown and the mortality-rates for the two five-year periods cannot be compared. As in the toxæmias already considered, earlier admission to hospital and better methods of terminating pregnancy would reduce the mortality.

SEPSIS

This heading covers all cases in which the patient died in another hospital after being transferred because of sepsis. It does not cover deaths from sepsis following the toxæmias and hæmorrhages of the later months, for these are dealt with in each separate group. The number of deaths from sepsis has fallen from 139 in the first five years to 98 in the second.

Sepsis following normal delivery.—There has been a striking fall in the number of deaths from sepsis after spontaneous delivery, for although over 1000 more normal cases were admitted to the hospital in the second five years, there were only 15 deaths as compared with 30 in the first. Those 15 deaths include 2 cases which were already infected on admission, delivery having occurred outside. The improvement is probably due to recognition of the fact that the commonest source of the hæmolytic streptococcus is the nasopharynx, the practical application of which includes the wearing of masks and the exclusion of all persons harbouring streptococci from contact with the patient during labour or the puerperium. For the second five-year period, the death-rate from sepsis following spontaneous delivery in the group under consideration is approximately 1·3 per 1000, which demonstrates that the risk of sepsis in hospital is no greater than elsewhere.

Sepsis following complicated delivery (excluding Caesarean section and "failed forceps outside").—The deaths from sepsis in this group have fallen from 42 in the first five years to 27 in the second. For the purpose of analysis cases have been divided into emergency and hospital cases, the latter including those admitted so early in labour that the hospital was really responsible for the conduct of the labour. The number of deaths in hospital cases remains the same, but there is a striking fall in the deaths in emergency cases, from 28 in the first five years to 13 in the second. The improvement in antenatal care has resulted in fewer cases being admitted as emergencies after prolonged labour and more before the onset of labour or in the early stages of labour. This is shown by the greater number of cases of contracted pelvis dealt with by the hospital (2335 in the second five years as compared with 1370 in the first) and by the greater number of forceps deliveries in hospital (1810 compared with 1260). The mortality in hospital cases has therefore diminished, since the number of deaths has remained the same in the two periods.

The results in this group show a great all-round improvement in the treatment of difficult labour, although there are still about 25 per cent. of these fatal cases which are probably avoidable. More than half of the rest of the fatal cases, which were probably unavoidable, were cases of uterine inertia, resulting in prolonged labour, repeated vaginal examination, and instrumental delivery. The fact that the cause of death in 4 cases was chloroform poisoning emphasises the unsuitability of this anæsthetic in cases of difficult labour.

Sepsis following "failed forceps outside."—The number of deaths from sepsis in this category has risen from 19 in the first five years to 22 in the second,

and the number of such cases admitted to hospital has risen from 190 to 236. The increase in this group is disquieting. In all the fatal cases the head was still high in the pelvis on admission, under which circumstances forceps delivery is rarely the correct procedure and is so difficult that it should be attempted only under the best conditions. Where there is a definite contracted pelvis in a primigravida, or a history of difficult delivery in a multipara, difficulty should be anticipated. Of the fatal cases, however, 9 were in multiparæ in whom the previous labours had been easy and where appreciation of the high position of the head in the pelvis was the only warning of probable difficulty. Hospital treatment can have very little influence on the mortality in this group.

Sepsis following Cæsarean section.—There were 424 Cæsarean sections performed for contracted pelvis in the first five years with 13 deaths from sepsis (3 per cent.), and 699 in the second five years with 14 deaths from sepsis (2 per cent.). The fact that the death-rate from sepsis after Cæsarean section has fallen from 3 to 2 per cent. is probably due to the more frequent use of the lower uterine segment operation in the second five years. In the first five years 410 classical Cæsarean sections were performed with 13 deaths (3 per cent.)—12 of which were due to generalised peritonitis—and 14 lower uterine segment sections with no deaths. In the second five years 449 classical Cæsarean sections were performed with 11 deaths (2·6 per cent.)—6 from generalised peritonitis—and 250 lower uterine segment operations with 3 deaths (1·2 per cent.), none from generalised peritonitis. This difference in the mortality from the two operations is all the more striking because a bigger proportion of the cases which had the lower uterine segment operation were "suspect"—i.e., cases where the risk of sepsis was greater because the patients had been many hours in labour. In the "suspect" cases in this group the notifiable pyrexia-rate was 18 per cent. in those who had the lower uterine segment operation and 45 per cent. in those who had the classical Cæsarean section. The risk of peritonitis is less after the lower uterine segment operation than after the classical Cæsarean section. The lower uterine segment operation might be employed more often in cases of minor disproportion, after unsuccessful trial labour, which in these cases may be the only means of deciding whether delivery from below is possible or not. It is certainly safer than the difficult forceps delivery or craniotomy which is the alternative in these cases.

Sepsis following manual removal of the placenta.—In the first five years there were 9 deaths from sepsis after manual removal of the placenta, 7 in hospital cases and 2 in patients delivered outside; and in the second five years 7 deaths, 3 in hospital cases and 4 in patients delivered outside. Numbers are too small to draw any conclusions.

Sepsis following abortion.—In the first five years there were 3290 cases of abortion admitted with 26 deaths (0·8 per cent.), and in the second five years 3219 cases with 11 deaths (0·3 per cent.). The reduction in the mortality-rate may be attributable to more strict enforcement of refusal to admit septic abortion cases. The only change in hospital technique is that packing of the vagina has been practically given up.

SHOCK

There were 58 deaths from shock in the first five years and 56 in the second. Deaths under anaesthesia have been included in this group for convenience.

Deaths under anaesthesia include 5 cases of delayed chloroform poisoning. In the fatal cases the operations were curettage for abortion (7), Cæsarean section for contracted pelvis (3), insertion of bougies (2), and forceps delivery after long labour (11), in 5 of which the cause of death was delayed chloroform poisoning. Chloroform was the anaesthetic in all cases except one, in which spinal anaesthesia was used.

The fact that delayed chloroform poisoning was the sole cause of death in 5 cases emphasises the danger of chloroform in obstetrics.

Deaths from shock, excluding those under anaesthesia.—In the first five years there were 48 fatal cases and in the second five years 42. There have been fewer deaths in emergency cases but just as many in hospital cases. As in the sepsis group, this is due to better antenatal care resulting in fewer cases of disproportion being admitted as emergencies and more being admitted before the onset of labour. But there is still room for improvement in antenatal care outside, for in the second five years 24 of the 42 fatal cases were emergencies. Of the other 18 which occurred in hospital cases death might have been avoided in several but was probably unavoidable in most.

Of the fatal cases in this group in the ten-year period 26 had rupture of the uterus, 4 in hospital cases and 22 in emergency cases. Eleven died undelivered. The average parity was seven, and there were only 2 primigravida. Of the 24 multiparæ 10 had had no previous difficulty. The increasing danger of rupture of the uterus with increasing parity should always be borne in mind, even where the labour is easy.

HÆMORRHAGE

In the first five years there were 104 deaths from antepartum and postpartum hæmorrhage and in the second five years 107. There is a diminished number of fatal cases of placenta prævia and an increased number of deaths from accidental hæmorrhage and postpartum hæmorrhage in the second five years.

Placenta prævia.—During the first five years there were 406 cases of placenta prævia with 53 deaths (13 per cent.), and during the second five years 487 cases with 37 deaths (7·5 per cent.). The immediate cause of death was hæmorrhage and shock in 56 and sepsis in 34. In 55 of the 90 fatal cases the patient arrived in good condition and in 12 she might have done so but for neglect of warning hæmorrhage. The fall in the death-rate in the second five years must be largely due to improved technique in hospital, but that this could be further improved is demonstrated by the fact that 22 of the 37 fatal cases in the second five years arrived in hospital in good condition. In many of those there was delay in emptying the uterus, either because the bleeding had ceased temporarily or the cervix was closed, making exact diagnosis difficult. One unit of the hospital has gradually in the last five years adopted the policy of emptying the uterus at once by Cæsarean section if the placenta is felt to reach down to within half an inch of or to cover the internal os, even although there may be no bleeding at the time. Blood transfusion is used extensively. During the second five-year period 174 cases of placenta prævia were admitted to this unit with 7 deaths (4 per cent.); and 3 of them were admitted moribund.

I see no reason why the death-rate from placenta prævia should be more than 3 per cent.—less than

half the present rate for the whole hospital. Some lives would be saved by earlier transfer to hospital on the first hæmorrhage. Most of the deaths would be avoided by improvement in hospital technique—that is, prompt emptying of the uterus after admission to hospital, the avoidance as far as possible of vaginal manipulation, and the extensive use of blood transfusion. This last has been employed far too little in the past: it was used in only 3 of the 56 fatal cases where hæmorrhage was the cause of death, and in only 7 of the 34 where sepsis was the cause of death. It should not be regarded as a desperate remedy but should be given as quickly as possible after the blood loss.

Accidental hæmorrhage.—During the first five years there were 527 cases with 24 deaths (4·5 per cent.) and in the second five years 633 cases with 32 deaths (5 per cent.). In 42 of the fatal cases the patient was so ill on admission that she died within a few hours. In 4 cases there was excessive bleeding, and the patient's life might have been saved by blood transfusion; but on the whole there seems little scope for improvement in the results of treatment along the usual lines. The question arises whether these catastrophes could be avoided by adequate antenatal care, since they are commonly believed to be the result of toxæmia; but an analysis of the more complete antenatal records of the second five years fails to show evidence of toxæmia in many of the cases. Even where there was toxæmia it was usually mild, hæmorrhage occurring suddenly without warning, so that antenatal care can do little in the prevention of accidental hæmorrhage. In 30 of the 56 fatal cases in the whole ten years the patient had had seven or more children, often in rapid succession. Better spacing of the children would probably diminish the risk of this complication.

Postpartum hæmorrhage.—During the first five years there were 16 deaths from postpartum hæmorrhage and 27 during the second period. Blood transfusion was given in only 2 of the 43 cases, although in 29 of these (14 hospital and 15 emergency cases) there was time available. Organisation of donors on a large scale should make it possible for these patients to have blood transfusion within a short time of the hæmorrhage.

Abortion.—In the first five years there were 3290 cases of abortion with 8 deaths from hæmorrhage (0·24 per cent.), and in the second five years 3219 cases with 10 deaths (0·31 per cent.). In 4 of the fatal cases the patient was moribund on admission, and in the remaining 14, although the patients did not die until after periods varying from several hours to several days after admission, blood transfusion was given in only 2. While the death-rate in this group is low, it could be further reduced by earlier admission to hospital and more frequent use of blood transfusion, which would also minimise the incidence of sepsis by improving the patient's resistance.

INTERCURRENT DISEASE

During the first five years there were 82 deaths from intercurrent disease and in the second five years 77. This group includes such conditions as pneumonia, tuberculosis, meningitis, cancer, and cardiac disease. Only the deaths from cardiac disease will be considered in detail.

In the first five years there were 345 cases of cardiac disease complicated by pregnancy with 36 deaths (10·4 per cent.), and in the second five years 606 cases with 39 deaths (6·4 per cent.). The reason for the fall in the death-rate is that women with severe cardiac disease are being admitted to hospital earlier and are being kept in hospital longer.

Here again, however, there is room for improvement, for in the last five years 27 patients were admitted very seriously ill and 8 of them died before the pregnancy could be terminated. The best mode of delivery varies with each case but is not the most important factor in deciding the outcome. The decision must be made early in pregnancy whether it is safe to allow the pregnancy to proceed. Where it is decided that the cardiac reserve is sufficient, the greatest care to preserve it should be taken by adequate rest in bed. In 15 of the fatal cases in the first five years, and 5 in the second, the cardiac lesion was so severe that pregnancy should have been prevented, preferably by sterilisation.

CONCLUSIONS

The maternal death-rate in the Glasgow Royal Maternity Hospital is falling—partly because of an all-round improvement in technique and partly because the more abnormal cases, which were formerly sent in as emergencies, are now being sent to hospital before labour or in the early stages of labour.

There is room for improvement both inside and outside the hospital. The chief faults inside the hospital are (1) the lack of proper organisation for immediate blood transfusion in cases of hæmorrhage, and (2) the fact that many urgent cases, which present most difficult obstetric problems, have to be dealt with by junior members of the staff because their seniors are non-resident. The faults outside the hospital are the lack of adequate antenatal supervision, particularly in the toxæmias, and unjustifiable attempts to perform major obstetric procedures under adverse conditions. The problem outside the hospital, however, is more difficult, owing to ignorance and lack of coöperation on the part of the patient. Moreover in Glasgow rickets in childhood (causing a high incidence of contracted pelvis), multiparity, poor housing, and poverty are all very important factors. As the class from which our hospital patients come cannot afford even a small fee to a family doctor, an extension of antenatal supervision by the local authority—possibly with compulsory notification of pregnancy—is urgently required. More hospital accommodation, especially for antenatal cases, is also a pressing need.

It is clear that in some 9 per cent. of the fatal cases pregnancy was a grave risk which the patient should not have been allowed to undertake. Sterilisation or contraception was indicated. Experience at the voluntary birth control clinic shows that most of the patients cannot pay the sum necessary for the purchase of contraceptive materials, and as there are no birth control clinics under the local authority in Glasgow, this matter deserves their immediate attention.

NEW HOSPITAL FOR MELKSHAM.—Plans for this hospital, to be erected with the Ludlow-Bruges legacy of £200,000, have been prepared. They provide for a cottage hospital with accommodation for about forty patients. The wards and the administrative block will be of one and two storeys respectively.

WALSALL GENERAL HOSPITAL.—Two members of the Hale family have promised to provide the money for a children's ward at this hospital. The present ward has room for 10 children only, and those above eight years old have to be accommodated in adult wards. The cost will be between £4000 and £5000.

CHRONIC CICATRISING ENTERITIS

A PHASE OF BENIGN NON-SPECIFIC GRANULOMA
OF THE SMALL INTESTINE

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GRANULOMATA of the intestine were formerly considered neoplastic, but later a "specific" group was isolated, leaving a non-specific residuum. To begin with, the granulomata of the large bowel received attention, and it is only in the last ten years that similar lesions in the small intestine have been adequately investigated.

Before 1895 most circumscribed chronic lesions of the intestine appear to have been regarded as neoplastic, but in that year Senn⁶⁰ distinguished between infective granuloma and carcinoma, while in 1907 Moynihan⁶⁴ reported six cases in which the original diagnosis of malignant disease of the large bowel was replaced by that of granuloma of the intestine. Two years afterwards Braun⁹ gave a survey of the condition and explained so-called cured cases of malignant disease as benign granulomata that had undergone resolution. Proust, Robson,⁵⁷ and Lejars⁴⁶ reported similar lesions. In 1913 Dalziel²² described cases in which the small, as well as the large, intestine was involved, and in one of these two feet of jejunum was removed at operation for partial obstruction.

Tietze⁶³ reviewed the condition in 1920. In some cases the cause of the granuloma was held to be tuberculous infection or syphilis, but in the majority no definite cause could be found. The non-specific origin of the granulomata of the intestine was emphasised by Moschcowitz and Wilensky⁶³ in 1923, while Mock⁶¹ in 1931 concluded that the benign non-specific granulomata did in fact form a definite pathological entity. He described their possible aetiology and symptoms, and believed them to be similar to tumours occurring elsewhere in the body. Since that time, although specific granulomata (e.g., tuberculous,^{12 17 23 32}) of the intestine have been reported, there is an increased tendency to regard many as of non-specific origin.^{3 59}

The importance of the benign non-specific granulomata affecting the small intestine was brought out by Crohn, Ginzberg, and Oppenheimer.¹⁹ Among 52 cases of non-specific granuloma of the intestine these authors isolated 13 in which the terminal ileum was involved.³³ To this localised condition the name of regional ileitis was given, although in America it also became known as Crohn's disease. Following this work numerous cases of granuloma of the lower ileum were reported under such titles as Crohn's disease, regional ileitis,¹³ regional enteritis,¹¹ chronic cicatrising enteritis,^{5 21 24} and localised chronic ulcerative ileitis.⁷ In some of them parts of the small intestine other than the terminal ileum were involved and lesions were found in the jejunum and in the duodenum. This more widespread involvement of the small intestine led Crohn¹⁸ to enlarge and amend his original concept.

It is interesting to note that almost all the recorded cases of non-specific granuloma of the small intestine are in the American literature; only a few are to be found in British and continental journals. In 1933

Molesworth⁶² in this country reported a single case of granuloma of the intestine with stenosis of the ileocaecal valve and likened it to cases described by Mock. In 1934 Jackman⁴⁰ described two cases under the heading of localised hypertrophic enteritis, while Dickson Wright⁶⁸ demonstrated two cases of Crohn's disease at the Medical Society of London in January, 1935. Owing to the recent interest in this condition the following case is recorded.

CASE-HISTORY

The patient, a man of 63, was of good family antecedents, and for thirty years had lived abroad as a medical missionary. In 1927 he was not allowed to return to China because of poor health. This however did not prevent him from holding several medical appointments in this country, and at the time of the onset of illness he was engaged in private practice in London. From 1927 he had suffered from indigestion and from "chills" which were liable to lead to vomiting. He also complained of indefinite pains in the back and chest which were attributed to "rheumatism and lumbago." He was seen by several doctors but no definite diagnosis was made, and he found that by following a simple diet he was able to overcome any temporary discomfort. For one year he had been losing weight and had seemed to be in poorer health.

Previous Illnesses.—Paratyphoid in 1906; sunstroke in 1907; typhoid in 1923; septic finger with cellulitis and axillary abscess in 1926, with amoebic dysentery in the same year.

History of Present Illness.—Early in September, 1934, the patient took his annual holiday and returned home seemingly fit. On Sept. 27th he felt "queer" and was unable to attend to his practice. Next day he complained of acute abdominal discomfort, and he was admitted the same evening to a London general hospital. On admission his temperature was 99.4° F. The liver was said to be enlarged and coarse friction was heard over the liver in the sixth right intercostal space. In view of the history of amoebic dysentery a tentative diagnosis of amoebic hepatitis was made and emetine gr. ½ was given intramuscularly. Examination of the stools failed to show entamoebæ or cysts. On three evenings the temperature rose to 99.4° but at all other times it was subnormal. On the third day he became difficult to manage, demanding food in the middle of the night and insisting that he was quite well. He rapidly developed a delirious condition in which he tried to get into bed without taking off his shoes and trousers, and on the sixth day he discharged himself from hospital.

During the next fortnight he was staying with relatives, and in the first week his physical condition showed little change. He was placed on a light diet, and to begin with took his food well. There was an occasional rise of temperature but no record was kept. During the second week he developed a thrombosis of the right calf and was admitted to the Hospital for Tropical Diseases, London. On the previous night his temperature rose to 101.4°, and he is said to have been making rambling remarks. On admission he was noted as appearing dehydrated and toxic, and during his stay his diet had to be supplemented by intravenous glucose-saline. Physically his condition remained unchanged; he had neither diarrhoea nor vomiting, and there was a slight rise of temperature on only two occasions. His mental state showed variation: at times drowsy, he was also at times violent. Sometimes he would refuse food by day, only to eat it at night. As the patient's uncoöperative attitude was dominating the clinical picture he was transferred to the Maudsley Hospital on Nov. 13th.

The *physical examination* on admission showed a middle-aged man, cachectic, and dehydrated, with sunken eyes and prominent cheek-bones. He lay in bed with his eyes closed and took no evident interest in his surroundings. He appeared to understand what was said to him, but would only answer by a nod of the head or a shrug of the shoulders. He would sit up or lie down, but would not coöperate in the finer tests. His breath was offensive,

the tongue was dry-coated, and the teeth showed pyorrhœa. Examination of the abdomen was difficult owing to the patient's failure to relax; the upper abdomen was held more tensely than the lower, which could be palpated satisfactorily. The patient indicated that he had had pain in the right iliac fossa but that it was no longer present. There was no visible peristalsis; no tumour or masses were found. The liver and spleen were not enlarged, the kidneys could not be palpated. Borborygmi were noted; the patient was incontinent of fœces, no blood or slime was present. No abnormalities were detected in the respiratory, musculo-skeletal, and central nervous systems. The heart sounds were weak but no murmurs were detected. The vessels were not unduly thickened. Blood pressure 110/70. The patient had glandular hypospadias.

Progress in Hospital.—The mental state continued negativistic; he resisted attention, but did not help himself. He showed little interest in his surroundings, and he occasionally made remarks, but no natural conversation was ever possible. Shortly after admission tube-feeding was started, and had to be continued at intervals. The patient vomited most days, and was also doubly incontinent. The vomiting was of two kinds—one immediately after being tube-fed, the other two hours later. It was never offensive or projectile. At one time the vomiting was so constant that for three days nothing but intravenous glucose-saline was given, and even then the patient tried to remove the needles. During December the vomiting became less frequent and he was able to take convalescent diet, at a few meals even feeding himself. Throughout he remained stuporous, and he never complained of pain or tenderness. The physical condition showed little change except that he appeared to be losing ground. The systolic blood pressure dropped to 78—the diastolic could not be detected. Four days before his death his temperature rose, on one occasion to 99·8°, but no cause for this could be found. Finally on Feb. 2nd he died quietly in his sleep.

CLINICAL AND LABORATORY DATA

The following data include tests carried out both at the Hospital for Tropical Diseases and at the Maudsley Hospital.

Temperature: Sept. 27th, 28th, 29th, daily swing from 97·6–99·4° F. No definite records are available for the period Oct. 2nd–16th. Oct. 16th, 101°; 17th, 100°; 19th, 99°. Thereafter subnormal till Nov. 12th, when 99° was again recorded; it continued at an average of 97° till four days before his death when 99·8° was reported, but it fell again to 97°.

Pulse: The rate remained between 70–80 till December when it rose to an average of 100 and remained at that level with little variation till within a few days of his death.

Weight: Sept. 30th, 7 st. 4½ lb.; Nov. 11th, 6 st. 6 lb.; Jan. 29th, 5 st. 12 lb.

Laboratory tests: The blood counts showed a progressive anæmia: 4,200,000–3,230,000 red cells per c.mm.; hæmoglobin, 80–58 per cent. The white count on admission was 12,000; thereafter no count above 4000 was obtained. The polymorphonuclear leucocyte percentage remained about 70 per cent. No abnormal red or white cells were seen. Neither vomit nor gastric analysis showed abnormal findings. Free acid was present in the fasting juice.

Fœces: The patient was incontinent of fœces on most days, but had diarrhœa only twice. Examinations for blood and slime were always negative. Culture of the stools showed *B. coli*, enterococci; no organisms of the typhoid group or entamœbæ were detected. *Giardia lamblia* cysts were found on several occasions.

Urine: A trace of albumin was present.

Other examinations of the blood including blood culture; urea and cholesterol estimation; and Wasser-

mann, Kahn, and Van den Bergh tests all gave negative or normal findings. The sedimentation-rate was increased; the blood-serum agglutinated typhoid 1:250. A levulose-tolerance test and examination of the cerebrospinal fluid failed to show any abnormalities. Several of these examinations were repeated more than once. Radiography was unfortunately impossible owing to the patient's lack of coöperation and his poor physical state.

AUTOPSY

The body showed extreme emaciation, but apart from the glandular hypospadias, the external appearance was otherwise normal. There was no evidence of an abdominal operation having been performed.

On opening the abdomen the great omentum was seen to be firmly bound down to the right iliac fossa. There was a generalised early peritonitis, non-hæmorrhagic, with very little free fluid. There was surface glazing of the peritoneum, with lymph flaking more conspicuous in the neighbourhood of the lower ileum and other portions of the small intestine.

At varying points along its length the small intestine



FIG. 1.—Diagrammatic scheme of the small intestine from the pylorus to the ileocecal valve, showing 13 places of thickening and 7 of thinning. Scale 1 mm. = 1 inch.

showed evidence of an inflammatory process in its walls. There were thirteen such portions as shown diagrammatically in Fig. 1, varying in length from ½ in. to 2 in. These portions were widely separated, as seen inside the abdomen, and in their neighbourhood the peritonitis was most evident. The first as measured in the formalinised specimen was 21 in. from the pylorus, the last 4½ in. from the ileocecal valve. In the fresh state these portions showed a relatively sharply defined area of congestive lividity. The adjacent mesentery was thickened and congested, but the mesenteric lymph nodes were not enlarged. The vessels in the mesentery appeared normal. These portions felt firm and hard, and on opening the gut the lumen of the intestine in these parts was narrowed and the wall greatly thickened. The degree of constriction varied but in the narrowest part the lumen was 0·5 cm. in diameter, and the thickest wall measured 0·9 cm. The thickness was associated with the presence of fibrous tissue and was greatest on the mesenteric side (Fig. 2). The mucous membrane had lost its normal rugæ, was thickened, more congested, and more spongy. There were one or two areas of ulceration.

There were also lengths of intestine which were ballooned out, with very thin walls, and no rugæ. Seven such portions were present, bearing no constant relation to the constricted parts. Sometimes they preceded or followed a constricted part (Fig. 3); sometimes normal gut intervened. The diagram explains the relation.

The inflammatory process did not show the same degree of activity in each of the thirteen portions. The more active lesions were in the neighbourhood of the lower ileum, and there the peritonitis was most marked, and there the omentum was bound down. The large intestine appeared normal saving for a small area of doubtful thickening in the cæcum. The appendix was normal.

The liver was slightly smaller than normal and showed slight back-pressure effect. No evidence of amebic hepatitis or abscess was found. The biliary tract was normal. The spleen was a toxic spleen. The kidneys were small with thinned, ill-defined cortices and slightly granular surfaces. The other abdominal organs were normal. In the thorax the lungs showed terminal bilateral broncho-pneumonia. There was no evidence of active tubercle in the pleuræ, lungs, or mediastinum. There was gross atheroma of the descending aorta. The heart and brain were normal.

MICROSCOPICAL EXAMINATION

Transverse sections of the localised lesions of the small intestine showed variations corresponding to the situation of the lesion. In general those nearer the ileocecal valve

showed evidence of a more acute pathological process than those further removed.

In the parts of more acute reaction there was much congestion and oedema of all portions of the bowel wall, and in these parts the mesentery was also involved. The reaction was a fibroblastic reaction with an infiltration of polymorphonuclear leucocytes, round cells, and plasma cells. In parts the reaction had gone on to a definite laying-down of fibrous tissue. The mucous membrane showed ulceration, and the submucosa was much thickened by congestion and cellular infiltration (Fig. 4). There were in parts accumulations of polymorphonuclear leucocytes with formation of small abscesses. The lymphoid tissue was not hypertrophied. The muscle coats showed most markedly the laying down of fibrous tissue, but there was also an infiltration with leucocytes. This infiltration was most evident in the tissue plane between the longitudinal and circular muscle coats. The serosa showed thickening with fibrinous exudate in which leucocytes were enmeshed.

In the parts of less acute reaction there was more fibrosis and less leucocytic infiltration. The mucous membrane was more intact. The striking feature of these portions was the presence of giant cells of foreign-body type in the tissue plane between the longitudinal and circular muscle coats. These giant cells were numerous and were found only in this plane. They were in close relationship to ganglion cells of Auerbach's plexus which appeared to be particularly prominent in these sections (Fig. 5). The giant cells contained hard-looking crystalline bodies of variable shape and size. In their neighbourhood the round-cell infiltration was more intense.

Everywhere the reaction was attended by great thickening of the bowel wall, with encroachment on the lumen. There was no pathological evidence of tubercle. The sections appeared to be those of non-specific granulomata of the small intestine. Sections of the ballooned portion showed a marked attenuation but without inflammatory reaction.

Sections of the liver showed a good deal of fatty degeneration particularly affecting the portal zone, but without inflammatory reaction. In the kidneys there was chronic glomerulo-tubular nephritis with acute exacerbation.

DISCUSSION

Symptoms and Signs.—This case, although presenting the pathological features of chronic cicatrising

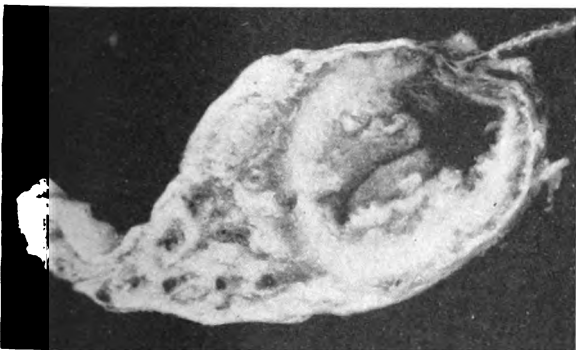


FIG. 2.—Photograph of a cross-section of the ileum showing thickening of its walls and mesentery.

enteritis, had an abnormal symptomatology owing to the patient's mental state.

Crohn¹⁹ divided his cases into four clinical types which have been adhered to by subsequent authors.

1. Acute intra-abdominal disease with peritoneal irritation.
2. Ulcerative enteritis.
3. Chronic obstruction of the small intestine.
4. Persistent intractable fistulae in the right lower quadrant.

Each of these types has its characteristic symptoms. In the first type acute appendicitis is simulated and

in this connexion it is noteworthy that appendectomy has been performed for the relief of symptoms^{25 56}; other cases of "acute abdomen" may represent the acute stage of this condition.^{39 40} In the second type the patient complains of colic and

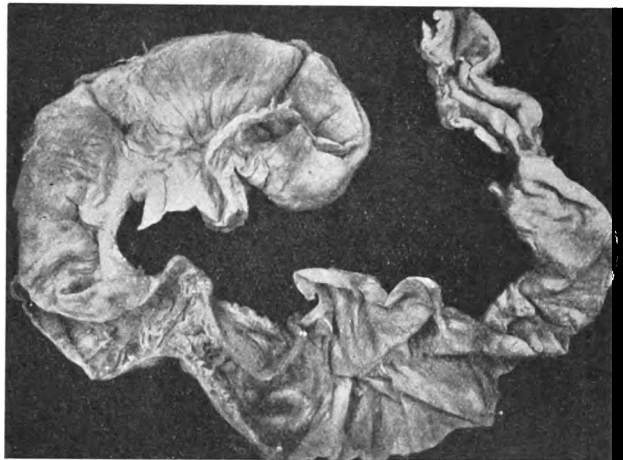


FIG. 3.—Photograph of a portion of the ileum showing adjacent constricted and ballooned parts.

frequency of bowel movements, and there is usually a low-grade constant fever. In the third type incomplete obstruction is encountered with violent cramps, borborygmi, and occasional attacks of vomiting and constipation; a palpable mass may be felt³⁴ and the obstruction may be complete.² In the fourth type intractable fistulae follow the operative drainage of a supposed appendix abscess.^{30 42} It is probable that these types represent phases of one progressive lesion¹⁶ and that therefore an overlap in the symptomatology is to be expected.

The age-period is worthy of note. Crohn¹⁹ originally described the condition as chiefly affecting young adolescents, but cases have since been reported involving all age-groups, even the sixth and seventh decade.^{10 50} Our patient was aged 63. Rockey⁵⁸ reported four cases in children operated on for appendicitis of ages 5, 9, 11, and 19 in which there was a hypertrophy of the terminal ileum with mesenteric adenitis and in which tuberculosis seemed to be excluded. The possibility of a familial incidence has been suggested by Crohn,¹⁸ who records two cases in children of the same parents.

Diagnosis.—Almost all of the reported cases seem to belong to the third group described by Crohn and therefore have been reported under the heading of chronic cicatrising enteritis. The cicatrization does not usually give rise to a gross form of obstruction, and in the absence of a palpable mass the clinical picture is often indefinite and the diagnosis difficult¹⁰; in our case, complicated by a severe mental illness, the diagnosis was not made during life. In these circumstances the diagnosis is often one by exclusion but Galambos and Mittelman,³¹ Kantor,⁴¹ and Weber⁶⁴ have described X ray appearances which they believe to be typical and diagnostic when the terminal ileum is involved.

The differential diagnosis is usually from neoplasms, malignant and benign⁴³; the specific granulomata, including hyperplastic tuberculosis, lymphadenoma, actinomycosis, and syphilis; and the localised inflammatory masses associated with chronic infection of the appendix and Meckel's diverticulum.^{19 38}

Chronic intussusception¹⁰ and twisted ovarian pedicle²⁰ have been simulated.

Etiology.—Chronic cicatrising enteritis is not the result of any single aetiological factor. It is a particular clinical example of granuloma of the intestine

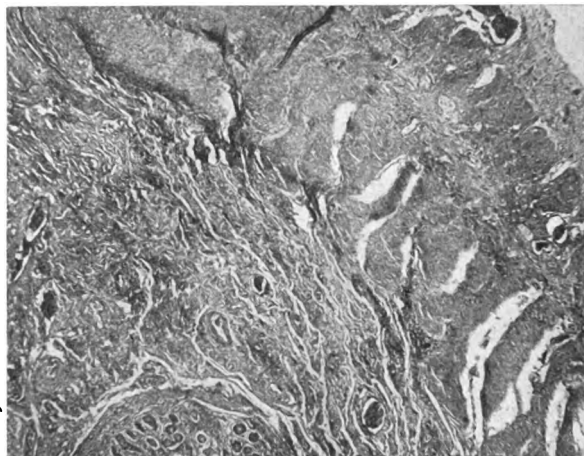


FIG. 4.—Low-power photomicrograph showing submucosa thickened with cellular infiltration and congestion.

of non-specific origin. It is believed that in every case an initial factor impairs the vitality of the gut wall and allows bacterial invasion from the lumen of the gut. The bacterial invaders are probably numerous in kind, but all produce a similar type of granulomatous reaction. In that sense all the lesions are non-specific.³

Mock classifies fully all the possible factors producing the local lessening of resistance which is followed by the production of these granulomata in the alimentary tract. Of these factors some are more or less theoretical, others more substantiated by the facts of the recorded cases. In the substantiated cases foreign bodies and infections appear to be outstanding. The former include fishbones, cherry pips, fruit cake, sponges in the abdomen, and particularly ligatures and sutures from a preceding operation. The latter include specific bacterial infection (e.g., bacillary dysentery), protozoal infections (e.g., amœbic dysentery), and metazoal infections (e.g., worms). Diverticulitis and ulcerative colitis sometimes precede a localised granuloma.

In the small intestine the foreign-body factor was at first thought to predominate; preceding operations were stressed in the case-histories and suture material was incriminated. More recently this factor has been found inadequate and suggestions have been made that mechanical factors operate either directly on the gut or on its blood-supply. Chronic recurrent self-reducing intussusception at the ileocecal valve, or an upset of local circulatory conditions by an appendicitis, might account for a terminal ileitis, but they would not account for lesions higher up in the intestine.

The case recorded here had a history of alimentary infection by *Entamoeba histolytica*, *B. typhosus*, *B. paratyphosus*, and *Giardia lamblia*. There was no evidence of foreign body and no abdominal operation had been performed. The other possible primary factors suggested by Mock and others,^{3 5 34 61} such as trauma, mechanical interference with the blood-supply, and extension of infection from extra-alimentary sources, were not found. The involvement of small intestine alone would appear to exclude

Entamoeba histolytica: the widespread involvement of the small intestine is against *B. typhosus* and *B. paratyphosus*. The giardia infection was present up to the time of death and giardia cysts were frequently and easily found in the stools. *G. lamblia* is a recognised invader of the small intestine,^{49 62} and attention has recently been directed to the widespread lesions caused by this organism in the small intestine by Little,⁴⁷ Lyon and Swalm,⁴⁸ and Paula e Silva.⁵⁵ In view of this work it is suggested that the giardia infection was the primary cause of the granulomata found in this case.

Pathology.—The pathological lesion in chronic cicatrising enteritis tends to be localised and may particularly affect the terminal ileum. Its localisation may be anywhere in the small intestine and a similar condition has been noted in the stomach.⁴⁵ The lesion may be multiple.

The lesion is a chronic inflammation of the wall of the gut with considerable stricture of the lumen. The inflammation involves the mesentery and the lymph glands may be enlarged.^{7 11 24} In the case reported no lymph nodes were involved. Ulceration of the mucous membrane may occur. Ballooning of portions of the gut has infrequently been observed.³⁸ It was present in this case.

Microscopically the lesions show a fibroblastic reaction with infiltration of polymorphonuclear leucocytes, round cells, and plasma cells.^{14 15 24 26 33 35 37} The inflammation involves all layers of the wall and is attended by fibrosis. Giant cells have been recorded,^{10 11 15 16 19 24 34 39} sometimes incorporating hard crystalline bodies of variable shape and indeterminate origin,^{6 26 33 53 65 66} although regarded by some as of lipid nature.³⁹ Their restriction to the intermuscular plane and juxtaposition to Auerbach's plexus is an outstanding feature of this present case. It is suggested that the involvement of Auerbach's

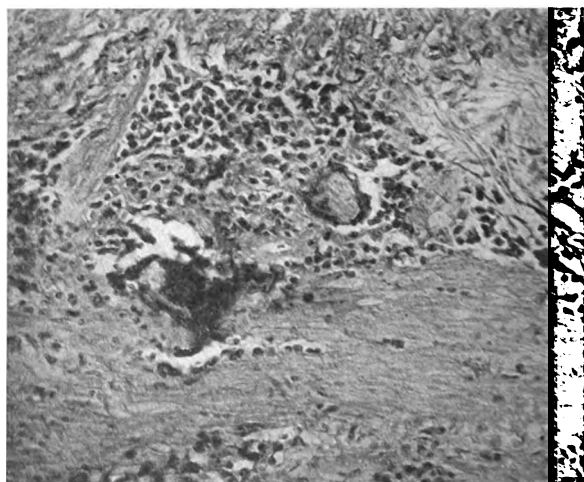


FIG. 5.—High-power photomicrograph showing the intermuscular plane. Giant cells with crystalline bodies are seen adjacent to Auerbach's nerve ganglion.

plexus by the inflammatory process accounts for the ballooning of portions of the gut.

The lesions do not appear to have any anatomical arrangement and show none of the features of tuberculosis.^{37 63} Hyperplastic tuberculous lesions of the ileum are rare and it is probable that some of the reported cases are really non-specific granulomata.^{53 65} In the present case the lesions reach as high as the

upper jejunum and a primary tuberculous lesion in this situation would be extremely rare.

The occurrence of metaplasia in the epithelium of the inflamed gut has been suggested by Donchess and Warren,²⁴ and a possibility of early carcinomatous change. This would be a further example of malignant change occurring at a focus of chronic infection.²⁷

Treatment.—Treatment at present consists of excision of the affected areas,^{11 26 34 35 38} with or without a short-circuiting operation. The fact that so many of the reported cases had been operated on previously for appendicitis^{15 18 19 21 33 39 53 66} seems to indicate the advisability of exploring the terminal and lower ileum in all cases of chronic appendicitis that come to operation.

SUMMARY

(1) A short historical survey of granulomata of the intestine is given, with special reference to a group involving the small intestine, isolated by Crohn. (2) The present case is one of chronic cicatrising enteritis and its symptomatology is discussed with reference to four clinical types. (3) Diagnosis is usually by exclusion. Typical X ray appearances have been described when the terminal ileum is involved. (4) Aetiologicaly many primary factors may operate, all producing an infective granuloma of non-specific type. It is suggested that the giardia infection was the primary factor in the present case. (5) Pathologically strictures and dilatations of the gut are met with. Microscopically giant cells incorporating foreign bodies of indeterminate origin are seen in a picture of chronic inflammation. In the present case they are in juxtaposition to the nerve-cells of Auerbach's plexus. (6) Treatment consists in excision of the affected parts.

Thanks are due to Dr. Edward Maphother for permission to publish this case; to Dr. P. H. Manson-Bahr and Dr. E. ff. Creed for their valuable help; and to Mr. Geary for preparing the specimens. The photographs were obtained by the aid of Dr. H. A. Ash. We are responsible for the opinions offered.

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ACRIFLAVINE AS A URINARY ANTISEPTIC

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ACRIFLAVINE has been used as a general and urinary antiseptic for some years; its action is directly antiseptic, not depending upon excessive acidity or alkalinity of the urine, although higher antiseptic values are obtained undoubtedly in alkaline than in acid urine. In the venereal diseases department of the General Hospital, Birmingham, it has been used intravenously in the routine treatment of acute gonorrhœa in 4985 cases. Numerous other so-called urinary antiseptics have also been used but in none has the improvement been so great as with acriflavine.

The application of this drug has not been confined to gonococcal infection; many cases of *Bacillus coli* infection of the urinary tract have also been treated successfully.

Similar reports have been made from time to time by other observers. In 1921 Davis¹ stated that "by a study of 204 aniline dyes, with only two (proflavine and acriflavine) was it possible to demonstrate the secretion of antiseptic urine following intravenous injection." In 1926 Jausion and Vaucel² claimed very successful treatment of gonorrhœa with intravenous acriflavine alone. Further, in 1932 Davis and Sharpe³ said that "acriflavine exerts an antiseptic action in normal urine which is uniform and consistent to a surprising degree." They also found that alkalinity is "quite essential for consistent and dependable results."

It should be stated that acriflavine as a urinary antiseptic must not be looked upon as the sole weapon in treatment; one must realise that the urinary tract is not a simple tube, but one into which there are many glandular openings, especially the ducts of the prostate and urethral glands. Obviously it is sometimes impossible to reach the real site of infection with a urinary antiseptic, although one may cleanse the surface of the tract temporarily, and it seems desirable, therefore, in all cases of urinary infection to attempt to increase a patient's resistance to a particular organism by, for example, vaccine treatment.

GONORRHŒA

As a routine all cases of acute gonorrhœa in the male have had intravenous injections of 2-4 c.cm. of a 2 per cent. solution of acriflavine in sterile distilled water. Ten such injections have been the standard course (one injection being given every second or third day). The patient has been instructed not to take large amounts of fluid, so that a higher concentration of acriflavine shall be obtained in the urine. The necessity for this precaution is well brought out by the experiments of Miller and Chu.⁴ (In accordance with what has been stated above, supplementary treatment, such as vaccine, irrigation, and potassium citrate grs. 60 t.d.s. to ensure an alkaline urine, has also been given.)

The intravenous route has always been chosen in order to get the immediate and maximum effect upon the urinary tract. In my opinion, one does not get such good results with acriflavine by mouth, and it seems more than probable that a large part of the acriflavine given by mouth will not be excreted through the kidneys at all.

Results.—In the 4985 cases of acute gonorrhœa which have been given acriflavine, perhaps the most noticeable feature has been the short duration of the urethral discharge; as a rule the discharge ceases in 7-10 days, which is very much less than is usual in the average case treated by irrigation alone. If the posterior urethra is already affected, acriflavine, which is being continuously excreted into the bladder, helps to clear the cystitis; while if the posterior urethra is not affected, the acriflavine apparently protects it.

It is obviously not possible with such a large number of cases to give accurate percentages of cure within a particular time; for many of the patients will not attend for tests of cure. But the very decided impression has been that the duration of the actual infection, like the duration of the initial discharge, has been much shortened by acriflavine.

B. COLI INFECTIONS OF THE URINARY TRACT

It is quite common for cases of *B. coli* infection to reach a venereal diseases clinic, sent up as possible gonococcal infections, perhaps because of epididymitis or frequency of micturition. Table I. shows the results in consecutive cases of bacilluria treated with acriflavine and also with an autogenous vaccine.

TABLE I

B. coli Bacilluria treated with Acriflavine and Autogenous Vaccine

Case.	Duration of urinary trouble before treatment.	Number of injections of 2 per cent. acriflavine.	Clinical result.	Pathological result (cultural).
1	2 months.	8 × 4 c.cm.	Cured.	Cured.
2	4 "	10 × 4 "	"	"
3	10 days.	8 × 3 "	"	"
4*	3 months.	8 × 4 "	"	<i>B. coli</i> still present.
5	3 "	10 × 2 "	"	Cured.
6	1 year.	10 × 4 "	"	"
7	5 months.	20 × 4 "	"	"
8	3 weeks.	30 × 4 "	No symptoms. Cured.	<i>B. coli</i> still present.
9	2 days.	8 × 4 "	Cured.	Cured.
10*	7 years.	28 × 4 "	Failure.	<i>B. coli</i> still present.
11	3 weeks.	8 × 4 "	Cured.	Cured.
12	4 days.	6 × 1 "	"	"

* Case 4 developed jaundice; no more acriflavine given.
* Case 7.—*B. coli* still present after first course of ten injections.
* Case 10.—Patient relapsed after being clear of *B. coli* in urine and clinically well.

These results are very strong evidence of the value of acriflavine, and compare favourably with those obtained by the use of a ketogenic diet⁵ or mandelic acid.⁶

EXPERIMENTAL

Acriflavine can be showed to have an extraordinarily high antiseptic value in regard to the gonococcus. I find that a dilution of 1 in 20,000 will kill the gonococcus in fifteen minutes. Its action upon such organisms as *B. coli* is, as one would expect, much less; some strains are only killed in thirty minutes in a dilution of 1 in 200.

It seems reasonable to expect that the urine of a patient who is receiving an antiseptic for a urinary infection should show definite antiseptic properties. In order to test this property, the urine of two patients was examined:—

- (a) A patient who was given 3 c.cm. of acriflavine (2 per cent.) intravenously and passed urine within half an hour.
(b) A patient who had been on hexamine grs. 10 and ammonium chloride grs. 15 t.d.s. for a week.

Four cubic centimetres of each of these urines were added to 24-hour cultures of gonococci; the suspensions of these gonococci in the urines to be tested were then put in the incubator at 37° C., and to each was added three drops of serum to ensure growth if antiseptic action had not taken place. Subcultures were then made at intervals of one, two, three, and four hours. The results are seen in Table II.

TABLE II

Growth of Organisms in Urine of Patients receiving (a) Acriflavine and (b) Hexamine and Ammonium Chloride

Hours	1	2	3	4
Urine A	+	-	-	-
Urine B—pH 5.4 (after addition of serum) ..	+	+	+	+

+ = Growth of gonococci } after 48 hours' incubation.
 - = No growth of gonococci

The tests were repeated on other patients with the same results and appear to confirm the clinical findings of the value of acriflavine as a urinary antiseptic.

PREPARATION OF ACRIFLAVINE

For nearly five years the acriflavine used in the above series was very satisfactory from a tolerance standpoint. There were a few cases of dermatitis on parts exposed to sunlight, such as face and hands, and also an occasional case of toxic jaundice; this was in accord with the findings of Jausion and Vaucel² and many others. In 1932-33, however, jaundice began to occur with great frequency, and it was quite obvious that it would not be possible to continue with the drug, at any rate in the same dosage as previously, although it seemed to be of great value in the treatment of urinary infections. Other observers were obviously troubled in a similar way, and Hughes and Birch⁷ in 1933 stated that they had abandoned flavine therapy owing to toxic effects. Correspondence in THE LANCET in 1931⁸ suggested that the acriflavines which were being used were not chemically identical.

Such contradictory experiences forced us to the conclusion that the acriflavine used in 1928 differed in some important way from that used in 1933, and in 1933-34 the products of different firms were tried. The prevalence of jaundice nevertheless continued.

In February, 1935, Imperial Chemical Industries Ltd., Dyestuffs Group, were asked to investigate the matter, and they have succeeded in supplying an acriflavine which is apparently non-toxic.* Since June, 1935, 300 patients have been given this new product intravenously according to the method described above, and in only 2 cases has there been any evidence of liver damage: in these there was transient jaundice for 48 hours only, and this may have been due to other causes. Every case has been investigated for signs of hepatic damage, and before each injection the urine has been examined for urobilinogen; this has been conspicuously absent whereas in 1933 it was found with great regularity.

In my opinion, patients who are receiving acriflavine should always be tested for the presence of urobilinogen in the urine and use of the drug should be discontinued if it is found.

* This preparation, Acriflavine (Intravenous), may be obtained from The British Drug Houses Ltd.

(References at foot of next column)

INBORN AND FAMILIAL TENDENCY TO THE DEVELOPMENT OF HEPATIC CIRRHOSIS*

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CASES of hepatic cirrhosis in children, not due to alcohol or congenital syphilis or any known cause of cirrhosis, are usually regarded as the manifestation or one of the manifestations of a congenital-developmental disease, and the occasional familial incidence of cirrhosis has often been adduced in support of this view. In this paper I shall shortly discuss the data in favour of there being an inborn tendency to hepatic cirrhosis (a congenital tissue or organ inferiority of the liver, as Prof. Brouwer would say, destined to manifest itself by obvious changes in postnatal life, with or without known exciting causes), and shall arrange my remarks under two headings: (I.) examples of the familial incidence of hepatic cirrhosis, in which the cirrhosis has not been due to any known exciting cause, such as alcohol or syphilis, or in which an inborn familial tendency to the disease may be presumed because an exciting cause such as alcohol, though present in one of the affected members of the family, was absent in others; (II.) examples of hepatic cirrhosis accompanying and probably constituting a part of acknowledged diseases of the congenital-developmental class.

But first I must explain what I mean by *diseases of the congenital-developmental class*. Under congenital-developmental diseases and abnormalities I include all truly inborn abnormalities and constitutional diseases, whether obvious at birth or manifesting themselves later at various ages. Amongst the more easily recognised ones are: hæmophilia; hæmolytic (acholuric) jaundice, and some other familial abnormalities of the blood (and hæmopoietic system); alkaptonuria, congenital porphyrinuria, and other inborn abnormalities of metabolism, such as Gaucher's disease, the Niemann-Pick disease, amaurotic family idiocy, familial cutaneous xanthomatosis, the Hand-Schüller-Christian lipid-granulomatosis, von Gierke's hepatomegalic glycogen-storage disease, &c.; renal glycosuria (apparently harmless in itself); familial optic nerve atrophy and other diseases, dysplasias and dysbiotrophic conditions in which the eyes are affected; numerous hereditary diseases and dysplasias of the skeletal (bone and cartilage), muscular, vascular, and nervous systems; and many minor conditions, including inherited abnormalities of the skin and its appendages; food-idiosyncrasies and allergic peculiarities. It is almost certain that many

* Some remarks on this subject, which are here amplified, were made by Dr. Parkes Weber in the discussion on Prof. B. Brouwer's paper on the Spleen, the Liver, and the Brain, at the meeting of the section of neurology of the Royal Society of Medicine on Jan. 16th, 1936.

(Continued from previous column)

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diseases, which are rarely obviously inherited—such as hypertrophic pyloric stenosis (which may occur occasionally in twins or recurrently in more than one child of the same parents) and Hirschsprung's megacolon congenitum and aortic isthmus stenosis—also really belong to the group under consideration.¹ All inborn constitutional diseases belong to the congenital-developmental group, even when their manifestations are delayed till long after birth, till puberty, middle age, or even later. It is because the manifestations are often delayed till long after birth that I prefer to speak of this group of diseases as the congenital-developmental group, and not as the congenital group.

Known hereditary or familial incidence may often be absent in diseases and abnormalities of the congenital-developmental class, but its occasional presence is sufficient to stamp the disease or abnormality as belonging to the class. Thus, the puzzling disease "lipodystrophia progressiva" apparently belongs to the class and seems to be a "dysbiotrophy" (if I may use the term, instead of "abi-trophy" of Gowers) of the subcutaneous fat over the head and upper part of the body, chiefly affecting females. L. Barraquer-Ferré² has lately narrated the case of a female whose mother and maternal grandmother were likewise affected. The disease, though potentially present at birth, may be "delayed" in its appearance long enough to allow of a female not being prevented by her shrunken death's-head-like face from finding a mate. Some would probably prefer to express themselves by saying that the lipodystrophia was potentially present at birth as a congenital tissue inferiority (Gewebsminderwertigkeit).

I.—EXAMPLES OF THE FAMILIAL INCIDENCE OF HEPATIC CIRRHOSIS, NOT DUE TO ANY KNOWN EXCITING AGENT OF THE DISEASE

Various cases of familial hepatic cirrhosis have been published.

At the Royal Society of Medicine (section for the study of disease in children) in February, 1934, Prof. F. Langmead³ demonstrated cirrhosis of the liver with splenomegaly in three brothers, aged 9, 11, and 13 years respectively. In the boy, aged 11 years, the diagnosis was subsequently confirmed by microscopic examination ("biopsy"), which showed typical multilobular cirrhosis of the liver. Langmead referred to Byrom Bramwell's account (1910) of a family with hepatic cirrhosis.⁴ Byrom Bramwell's patient, a boy, aged 9 years, had ascites, œdema, jaundice, fever, and a large liver, and the necropsy showed typical "hob-nailed" cirrhosis. Three other members (girls) of the family of seven apparently died from hepatic cirrhosis. Langmead also mentioned J. Szanto's⁵ three cases of multilobular cirrhosis of unknown origin, with splenomegaly, in a family of ten. In one of these cases the diagnosis of hepatic cirrhosis was confirmed by necropsy (a boy, aged 15 years) who likewise had genital hypoplasia.

F. J. Poynton and W. G. Wyllie⁶ in 1926 described two cases of congenital familial hepatic cirrhosis of unknown ætiology in a brother and sister, aged 9 years and 4 years respectively, but the diagnosis of von Gierke's hepatomegaly (hepatomegalia glycogenica) was subsequently suggested.⁷

In 1903 I recorded the necropsy on a girl, aged 14 years, with biliary cirrhosis ("Hanot's disease") of the liver.⁸ Her sister was said to have died at the age of 19 years with similar symptoms. J. Dreschfeld⁹ met with hypertrophic hepatic cirrhosis in two brothers, one of them was a drinker and the other temperate. Sir William Osler¹⁰ mentioned two

brothers in America affected with Hanot's cirrhosis. Boinet¹¹ wrote of a family in which the father and two children had biliary cirrhosis (Hanot's type) and three other children had enlarged spleens. J. Finlayson¹² spoke of three brothers and a sister, two of whom had cirrhosis of Hanot's type; another had enlargement of the liver and spleen, with icterus, and the remaining one had slight jaundice. Hasenclever¹³ recorded an instance of three members of one family, a boy and two of his sisters, having typical hypertrophic biliary cirrhosis.

II.—EXAMPLES OF HEPATIC CIRRHOSIS ACCOMPANYING AND PROBABLY CONSTITUTING A PART OF ACKNOWLEDGED DISEASES OF THE CON- GENITAL DEVELOPMENTAL CLASS

Progressive lenticular degeneration (Kinnier Wilson's disease).—Wilson's disease is a chronic progressive degeneration of the lenticular nuclei of the brain combined with a cirrhosis of the liver, which has been usually latent during life and first discovered at the post-mortem examination. Familial incidence in this rare disease has been emphasised by Wilson himself, as well as by later authors. The evidence seems to me to point to the disease being most probably a combined "dysbiotrophy" of the lenticular nuclei and the liver, and the hepatic constituent of the combined condition in some cases does give rise to obvious clinical symptoms so as to be recognised as a form of familial cirrhosis even during life.¹⁴ In some cases the lenticular nuclei or the liver may be only slightly affected, but it seems very unlikely that any of the above-mentioned cases of familial hepatic cirrhosis in children were of the nature of incomplete Wilson's disease with the liver only affected.

Hæmochromatosis.—The occurrence of hepatic cirrhosis ("pigmentary cirrhosis of the liver") as a part of hæmochromatosis or "bronzed diabetes" is too well known to need insistence. The site of the greatest visceral changes varies in different cases, and the characteristic liver changes may occur even without very marked cutaneous pigmentation. The occasional familial incidence of the disease has been pointed out by J. H. Sheldon,¹⁵ R. D. Lawrence,¹⁶ and others, so that hæmochromatosis must be classed amongst the rare inborn abnormalities of metabolism, such as alkaptonuria, pentosuria, cystinuria, congenital porphyrinuria, the inborn abnormalities of lipid metabolism, &c., which I have above referred to. Indeed, a special analogy may be pointed out in regard to von Gierke's hepatomegalic glycogen-storage abnormality, in as much as in the latter disease different viscera (e.g., the heart) may be specially involved in different cases.

Erythræmia.—Though I think that erythræmia of the Vaquez-Osler type is, like the leukaemias, due to a neoplastic change in the bone-marrow, a familial incidence of the disease has been reported in quite a number of cases.¹⁷ It may be presumed to develop (under the action of unknown agents) in individuals having an inborn constitutional predisposition. Hepatic cirrhosis is a recognised though only occasional complication of erythræmia, and seems in some cases to occur independently of any special agent such as phenylhydrazine, which may have been used in the treatment.¹⁸

Telangiectasia of the Osler type.—Very many valuable papers have been written on this disease, including regular monographs with copious bibliographies, by H. I. Goldstein, who was, I believe, the first to call it the "Rendu-Osler disease," by which name it is now known in France. In many cases, though

in far from all, there has been striking hereditary incidence. I was fortunate enough to be able to describe a typical familial example in 1907¹⁹; and in 1924²⁰ I alluded to the possible analogy and association of the telangiectatic condition of the skin and mucous membrane of the nose and mouth with certain hæmorrhagic telangiectatic conditions in the stomach, intestines, kidneys, or lungs. In fact, it is quite possible that in rare cases the typical cutaneous telangiectases may be altogether absent. Very few complete post-mortem examinations have been published, but recently Ludo van Bogaert and J. H. Scherer²¹ found hepatic cirrhosis present in a typical familial case of the Rendu-Osler type of telangiectasia. From what I remember of the progress of the patient I described in 1907 there may well have been visceral disease and perhaps hepatic cirrhosis present at the end. I have been told of an as yet unpublished case in which hepatic cirrhosis was found at the post-mortem examination; so it was also in a remarkably atypical case, the liver and spleen from which were recently (Jan. 13th, 1936) demonstrated by Mr. R. Davies-Colley at the Medical Society in London. The telangiectasia in this disease must be regarded as due to a congenital-developmental dysplasia of the small blood-vessels, potentially present at birth, though often not manifesting itself by obvious changes till after puberty. What is the relationship of the hepatic cirrhosis, when present? Is it the result of an associated developmental dysbiotrophy of the liver—i.e., a congenital tissue or organ inferiority in the sense intended by Prof. B. Brouwer and others? The subject is complicated by the well-known fact that in advanced or active hepatic cirrhosis there is a tendency for the patient to develop cutaneous telangiectases on the face and hands, notably those of the spider-like type, as I have had occasion to observe.

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MODERN VIEWS ON HYPERTROPHY OF THE PROSTATE

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THE prostate is a complex gland situated beneath the orifice from which the bladder is emptied and including the prostatic sinus (uterus masculinus). It is composed of tubular-gland tissue embedded in a stroma of connective tissue and unstriated muscle-fibres. The prostate increases in size with age, and may hinder the evacuation of the bladder and even lead to retention of urine.

In adenoma there is an increase in the glandular tissue and the prostate is enlarged and soft. In myoma, muscular tissue predominates. In fibrous degeneration the prostate is of a firm consistence and not always enlarged. In hypertrophy these three tissue elements are met with in varying proportions.

According to the latest statistics, about a third of men aged 60 years and upwards suffer from the prostate and for a long time treatment has been sought to cure or relieve them.

Historical

The first description of hypertrophy of the prostate dates from the sixteenth century. On the ground that hypertrophy of the prostate is a manifestation of old age closely related to the sexual function, surgeons have long endeavoured to cope with it through the medium of the genital system. In 1884 Lannois, in France, suggested castration, but although the clinical results were satisfactory (Burkhard claimed success in 69.2 per cent., Cabot 83.6 per cent., and White 87.2 per cent.) the psychological reaction and ensuing cachexia were so alarming that the succeeding generations of surgeons abandoned this method of treatment. Only in veterinary surgery is hypertrophy of the prostate dealt with by means of castration. Unilateral castration (Albarran, Motz, Pavone) does not lead to any improvement. Harrison in 1893 substituted for castration section of the vasa deferentia, but without obtaining any results. Later Bier, also unsuccessfully, ligatured the vessels leading to the testicle.

As a result of advances in surgical technique, prostatectomy became at the beginning of the present century the routine treatment of prostatic obstruction, and for a time interest in other methods of treatment was lost. It was revived when Romeis reported a marked reduction in the size of the prostate of a man of 68 following the implantation of the testicle of a young man of 22. Since then the close connexion between prostatic hypertrophy of old age and diminution in the internal secretion of the testicle has been confirmed by many observations on animals.

Experimentally, Steinach succeeded in greatly increasing the internal secretion of the testis by blocking the external secretion, but when bilateral ligature of the vas deferens was applied to prostatic enlargement the results were negative. In 1927 I endeavoured to influence prostatic hypertrophy by ligature of the efferent ducts where they emerge from the testis at the level of the head of the epididymis. This produces the maximum increase in the internal secretion of the testis (Steinach). The attempt was more successful, the size of the prostate being diminished in the majority of cases.

In 1933 Landau discovered in cats a constant sympathetic ganglion situated in the connecting capsule surrounding the efferent ducts in the head of the epididymis. This corresponds to the point where the vasa deferentia penetrate the posterior surface of the testis and is the site of my ligature. Nicod found a ganglion in man at the same point. Landau and Heitz-Boyer are both of the opinion that the action of the ligature on the prostate is of a reflex nature, while I¹ believe it to act through the endocrine system.

In 1933 Laqueur and van Cappellen published the results obtained in hypertrophy of the prostate by daily injections of 4–20 units of testicular hormone (Hombreol). In the same year Lacassagne administered 500 units a week of the hormone of the female sex gland (œstrin) to male mice for a period of five months and observed a considerable development of the posterior lobe of the prostate, retention of urine, and secondary hydronephrosis. His observations were confirmed in 1934 by Burrows and Kennaway. Lacassagne and de Jongh also made the interesting observation in 1933 that injections of benzoate of folliculin (œstrin) in young mice, in normal adult mice, and castrated adult mice produced a canceroid epithelial proliferation of the posterior lobe of the prostate, which proved fatal in about six weeks. In 1934 Courrier and Gros asserted that they found marked enlargement of the prostate and seminal vesicles in monkeys treated with folliculin and at the same time an extraordinary development of the unstriped muscle of these organs. In the following year there appeared very interesting articles on the enlargement and alteration of the prostate and seminal vesicles obtained by injecting œstrin into monkeys (Parkes and Zuckerman) and into rats (Laqueur and de Jongh).

Experimental Work on Animals

The fact that hypertrophy of the prostate has been observed in monkeys, dogs, and rats has made it possible to throw light on the subject by means of animal experiments. Long ago John Hunter proved that when castration was carried out in young animals the prostate did not develop, and that after the operation in adult animals it atrophied. Subsequent work has shown that the prostatic secretion stops 53 days after removal of the testicle (Gley, Pézard). The same occurs after a severe lesion of the testicles produced by radium or X rays. When Lower caused anæmia of the testicles by ligature of the arteries he obtained not only a pronounced degeneration of the tubular elements and the interstitial cells, but also a secondary atrophy and sclerosis of the prostate.

All these experiments show that the prostate atrophies and degenerates as soon as the influence of the testicles is removed by castration, by the action of radium and X rays, or by the cutting off of the blood-supply. Lower found that when he subjected the sex glands of rats or dogs to the influence of small doses of radium or X rays the testicles underwent a 50 per cent. reduction in size and weight, the tubules being completely destroyed, but the interstitial cells of Leydig which are more resistant to radiation increased in number. Associated with these changes there occurred an enlargement of the prostate and seminal vesicles. Exactly the same results could be obtained from bilateral operative cryptorchism, that is to say, returning the testicles into the animal's abdomen.

These two experiments prove that destruction of the germinal epithelium and proliferation of Leydig's cells lead to hypertrophy of the prostate. After the vasa deferentia of rats and dogs had been ligatured without damaging the blood-vessels Lower reported that the testicles, prostate, and seminal vesicles showed no change after several months' observation. He therefore concludes that occlusion of the vas deferens does not have any influence on the testicles or prostate.

Steinach, on the other hand, claimed that vasoligature enabled an old animal which had previously micturated with difficulty to empty its bladder, and Slotopolsky stated that after Steinach's ligature II. the old germinal epithelium disappears but is replaced by a newly formed germinal epithelium. From this we can infer that the renewal of the germinal epithelium and reabsorption of its secretion by the circulating blood are followed by a shrinkage of the hypertrophied prostate. A variety of hormones has been used experimentally on animals in order to study their action on the prostate. Whilst research on this subject is still incomplete, the most important results may be summarised as follows:—

I

Influence of the Male Hormone on the Development, Preservation, and Shrinkage of the Prostate

It is known that there are many female hormones and to-day it is admitted that there are also many male hormones. According to McCullagh the male sex gland secretes two hormones:—

(a) A fat-soluble hormone, probably secreted by the interstitial cells of Leydig, which stimulates the development and function of the accessory sex glands including the prostate.

(b) A water-soluble hormone, supposed to be produced by the germinal epithelium, which exerts an inhibitory action on the anterior lobe of the pituitary and the production of prolactin which retards the development of the prostate.

Further, there has been found in the urine of men and even women a male hormone (androstenediol) which, according to Laqueur, is not identical with the hormones of the testis (androsterone) and is chiefly responsible for the growth of the cock's comb in fowls.

II

Influence of the Female Hormones, in particular the Estrogenic Hormone (Folliculin), on Changes in the Prostate

The female follicular hormone (folliculin, œstrin) is normally present just as well in the male as in the female.

In the mouse, small doses of follicular hormone cause typical signs of growth, not only of female organs like the vagina, uterus, tubes, and mammae, but also of the male organs—prostate, seminal vesicles, and ampullæ of the vasa deferentia. By increasing the dose of folliculin the quantitative physiological balance between the male and female hormones is upset on the female side and pathological tissue proliferations appear in the prostate, seminal vesicles, and ampullæ of the vasa deferentia. There is an extensive increase in the unstriped muscle which becomes thickened; at the same time connective tissue and proliferations showing keratinisation appear in the posterior part of the prostate and hinder micturition, so that de Jongh always found the bladder distended in the male mouse, and in rats and guinea-pigs treated with Menformon the seminal vesicles were ten times as large.

The proliferation takes place chiefly in the posterior region of the prostate, which corresponds exactly to the group of glands which develops spontaneously in old men, causing hypertrophy of the prostate (de Jongh). If the injections of menformon are stopped the prostate shrinks completely in mice in three days' time (de Jongh).

Substances like benzoylate of menformon or benzoate of folliculin are even capable of causing growths similar

¹ Schweiz. med. Woch., 1934, lxiv., 557.

to cancer in the posterior part of the prostate (see results obtained by Dodds, Lacassagne, de Jongh). It is therefore possible to start a pathological new growth in the prostate with a female hormone.

All these changes were absent when de Jongh administered both male (hombreol) and female (menformon) hormones together. The prostate was unaltered.

III

Influence on the Prostate of the Hormone of the Anterior Pituitary Lobe: Prolan

Lower, working with sexually immature rats, succeeded in obtaining premature development of the sex glands, prostate, and seminal vesicles by administering prolan B, the hormone of the basophil cells of the anterior pituitary lobe. In adult animals he obtained hypertrophy of the prostate (adenoma) and proliferation of the seminal vesicles by the same means. Extracts of the anterior pituitary lobe were found to be just as active as extracts of the urine of pregnant women.

On the other hand, Engle and Smith found that removal of the anterior pituitary lobe in young rats checked the development of the gonads, prostate, seminal vesicles, and Cowper's glands.

Free secretion of the sex glands inhibits the effect of prolan and for this reason the prostate develops up to puberty and again after 50. Decrease in the quantity of hormone from the sex glands stimulates the secretion of prolan and consequently leads in advancing age to hypertrophy of the prostate.

The loss of the sex glands (castration) is followed by hypertrophy of the anterior lobe of the pituitary,² the cells of which become rapidly exhausted by the excretion of prolan. This secretion though temporarily increased loses all action on the prostate, for, according to the majority of authors, prolan does not act directly on the prostate but indirectly through the medium of the sex glands.

Lower anastomosed the blood-vessels of a rat recently castrated with those of a normal rat. Although the pituitary of the normal rat showed no alteration, the sex glands, prostate, and seminal vesicles were hypertrophied (by the action of the hypertrophied anterior lobe of the pituitary of the castrated animal). These changes only occurred after ten days. Thirty days later the prostate had increased 40 per cent. in size and weight and was composed chiefly of gland tissue (adenoma).

The same results were obtained by injections of the hormone secreted by the basophil cells of the anterior lobe of the pituitary.

In old age, which may be regarded as Nature's method of performing a gradual, incomplete, and discreet castration, the hormone of the sex glands diminishes imperceptibly so that the pituitary has plenty of time to produce its prolan and evoke hypertrophy of the prostate.

The above results may be summarised as follows: Male hormone stimulates the normal development of the prostate. Female hormone produces the formation of fibromyoma of the prostate, and benzoate of folliculin a proliferation of the pavement epithelium of the prostate. Basophil hormone of the anterior lobe of the pituitary (prolan) gives rise to prostatic adenoma.

Prostatic Enlargement in Man

In man also the hormone of the male sex glands regulates the development, preservation, and functions of all the accessory glands, including the prostate. The human prostate attains its normal size at puberty equally with the growth of the testicles and the development of the secretion of the interstitial cells of Leydig. At the onset of the activity of the germinal epithelium the development of the prostate ceases so that the gland remains stationary from puberty

to the sixth decade. From the age of 50 the testes become smaller and softer. While the number of the interstitial cells of Leydig remains unaltered, the secretion of the germinal epithelium and with it the production of spermatozoa gradually diminishes and perhaps is stopped completely. At the same time the prostate renews its development.

If the secretion of the interstitial cells of Leydig is normal the prostate is developed by puberty and keeps within normal limits as long as the secretion of the germinal epithelium is sufficiently plentiful. If the secretion of the interstitial cells of Leydig is lacking the prostate cannot develop. This is the reason why hypoplasia of the prostate is met with in hypoplasia and anomalies of the testicles (Kaufmann) and atrophy of the prostate follows loss of the testicles. Lower found the prostate atrophied, small, fibrous, and hard in ten eunuchs in whom he was not able to demonstrate the presence of the male hormone in the urine. The relation between the testes and prostate is therefore unquestionable.

The prostate is also under the control of the hormone of the basophil cells of the anterior pituitary lobe. When with advancing age the secretion of the germinal epithelium diminishes and gradually dries up the pituitary endocrine centre seeks the aid of prolan to re-establish the function of the genital glands. But a powerful and prolonged action of prolan takes place indirectly—probably through the medium of the cells of Leydig—and promotes the formation of prostatic adenoma. The increased secretion of prolan begins as soon as it is no longer inhibited by an adequate secretion from the germinal epithelium, and continues until the basophil cells of the pituitary are gradually exhausted and replaced by eosinophil cells.

The female follicular hormone also influences the prostate. The follicular hormone is present in the testes and male urine. It stimulates the growth and normal development of the generative system, within the normal physiological limits of its action, together with the male hormone. In the male it is balanced by the hormone of the germinal epithelium, in the female by the hormone of the corpus luteum. Each hormone has its own sphere of action; thus according to de Jongh the follicular hormone controls: (a) In the female genital system, the muscular tissue of the vagina, uterus, and tubes; it induces the growth of pavement epithelium of the vagina and cervix uteri and finally the development of the breasts. (b) In the male, the plain muscle of the prostate, seminal vesicles, and vasa deferentia, together with the connective tissue of their ampullæ, the pavement epithelium³ of the prostate, and the efferent ducts of the seminal vesicles. As de Jongh so aptly puts it: the female hormone produces "a female rut in the male prostate"; the proliferation of the epithelial, muscular, and connective tissue cells of some parts of the prostate leads to its hypertrophy.

In old age the secretion of the sex glands in man is reduced by half (Lower),⁴ while the female hormone is maintained (Laqueur). In this way the physiological equilibrium between the testicular and follicular hormones is upset and the female hormone increases its effect. This accounts for the activity in the prostate, with neoplastic formations at the time of the male climacteric. The secretion of the interstitial

³ The columnar epithelium of the prostate is developed under the influence of male hormone (Lacassagne).

⁴ This increase in size is explained by considering that after castration, the inhibitory action of the sex glands on the basophil cells ceases to have effect as soon as the activity of the anterior lobe of the pituitary becomes increased.

² Normally a man passes 10–24 units of male hormone in the urine in 24 hours. By noting the elimination of hormone in the urine it is possible to tell exactly when an abundant secretion of male hormone becomes much diminished.

cells of Leydig being no longer balanced by that of the germinal epithelium, the prostate enlarges. At the same time there is a rise in the prolan circulating in the blood, which in turn, by stimulating the secretion of the cells of Leydig, leads to hypertrophy of the prostate. If there be a predominance of follicular hormone over male hormone, the prostate hypertrophies and degenerates.

From a consideration of the rôle which these hormones play in the development of the prostate we can conclude that:—

(1) The normal secretion of the interstitial cells of Leydig contributes to the normal development of the prostate.

(2) The pituitary prolan as well as the secretion of Leydig's cells if excreted for a considerable time in increased amounts produces adenoma of the prostate.

(3) An excess of follicular over male hormone leads to the formation of a fibromyomatous prostate.

All these typical alterations of the prostate, which vary in type and degree, can only occur if there be a shortage of hormone from the germinal epithelium. Hence de Jongh's dictum "the testicle protects us from pathological changes in the prostate."

Treatment

If in old age we could augment the internal secretion of the sex glands, especially that of the germinal epithelium, not only would the increased output of prolan be stopped but the physiological balance between male and female hormones would be re-established and the prostatic enlargement reduced. With this end in view the following methods of treatment have been used:—

(1) Injections of male hormone (Laqueur, van Capellen).

(2) Transplantation of testicles of adults (Romeis).

(3) Steinach's ligature II., diversion into the blood stream of all the secretion from the germinal epithelium (Niehans).

Treatment by means of hombraol consists in giving injections of 1 c.cm. of oil of hombraol once or twice daily for three weeks. Laqueur and van Capellen claim that by this method improvement is maintained in some cases for six months. For information on the subject of treatment by means of transplantations of the testes the work of Romeis should be consulted.

In 1928, in a prostatic case aged 69, I applied an inter-epididymo-testicular ligature such as had been advocated by Steinach in order to enhance the endocrine function of the sex glands and bring about rejuvenation. The result was surprisingly good, not only with regard to the general improvement in the patient's condition but also to the effect on the prostate. I showed this case in Montreux in 1928 at the Swiss Surgical Society. The ligature between the testicle and the head of the epididymis closes the efferent ducts through which the external secretion of the testicle escapes, with the result that the hormone of the germinal epithelium as well as the hormone of the interstitial cells of Leydig pass through the pores of the albuginea into the numerous veins which surround the testicle and thus gain the general circulation. This brings about a rejuvenation of the enfeebled organism in the sense that the old cells are reabsorbed and young cells formed. Further it inhibits the abnormal development of the prostate by reducing the hypersecretion of prolan and by re-establishing the physiological balance between male and female hormones.

I described the operative technique in 1930 pointing out that the ligature must not be placed level with the superior pole of the testicle but as near as possible

to the head of the epididymis, so as to avoid putting the albuginea of the testicle under tension and thus hindering the passage of the hormone of the genital glands into the blood stream. Briefly the technique is as follows:

(1) Place a silk ligature in the groove between the epididymis and the testicle, not level with the testicle but level with and even, if necessary, encroaching on the head of the epididymis. If the ligature be placed at the level of the testicle, as recommended by M. Chevassu and as is possibly the practice of other operators, the inelastic covering of the testicle is put under permanent tension whereby the internal secretion is likely to be obstructed, for the testicular hormone would no longer be able to pass through the fine pores of the albuginea and reach the veins which surround the testicle. If both means of egress for the testicular hormone—the vasa deferentia and the blood stream—are closed,

an extreme hypertension is produced by stasis and even the massive necrosis described by Slotopolsky may occur. The testicle becomes swollen and acutely tender, a complication which has been wrongly imputed to Steinach's ligature II. instead of to a faulty technique.

(2) Tie all the efferent ducts of the testicle (15 according to Kaufmann), applying the ligatures tightly but without dividing them. If the ducts are divided the external secretion would persist—which is not desired.

From 1927 up to the present I have relieved, by this very simple procedure, nearly 400 patients suffering from enlargement of the prostate. The operation can be done painlessly under a local anaesthetic, a fact that is alone sufficient to warrant for this simple procedure a wide appreciation.

RESULTS OBTAINED FROM STEINACH LIGATURE II

The general rejuvenating effect has been sufficiently observed, both in animals and man, by so many prominent men of science as to remove any doubt about it. As a frequent result of the ligature the heart is invigorated, the pulse becomes regular, the circulation improved, the arterial tension reduced to normal, headache and vertigo disappear, the appetite is improved, metabolism increased, calcareous deposits in arteries and joints are absorbed, musculature strengthened, the gait made firm and upright, sleep restored by the removal of nocturnal frequency of micturition, and clearness of thought and ability to undertake intellectual work restored. The effect of the ligature on the prostate itself is rapid in its action on spasm of the sphincter. It is less rapid in its action on the enlargement.

The painful straining gradually abates, the patient once more empties the bladder without effort, the

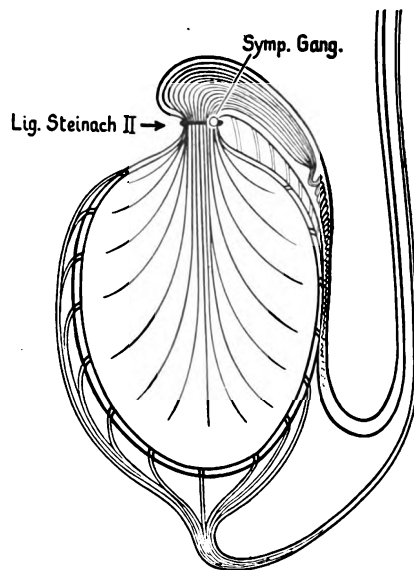


Diagram to illustrate the operative technique of Steinach's ligature II.

stream becomes more forcible, and in the majority of cases the residual urine entirely disappears. This result lasts for years and has been checked by a great number of cases in which there was no departure, either clinical or histological, of the prostate from the normal.⁵

Three of my cases will suffice to show the action of Steinach's ligature II., both on the sphincter spasm and on the hypertrophy.

1. *Spasmodic contraction of the bladder sphincter.*—Man aged 61; dysuria since the end of September and unable to pass more than 60 c.cm. urine at a time without great difficulty. Bladder distended up to the umbilicus. Ligature Steinach II. Oct. 13th, 1933. One and a half hours after the operation the patient voided 400 c.cm. urine and since then on an average 300 c.cm. four times a day. This patient had never had a catheter passed as he had a narrow and much inflamed phimosi.

2. *Hypertrophy of the prostate.*—In 1929 I performed a Steinach's ligature II. operation on a colleague aged 57, suffering from adenoma of the prostate, who was only able with great difficulty to pass a few drops of urine at a time. In order to estimate the improvement which followed, this patient measured the projection of his stream on the ground. This gradually increased from zero up to a metre which equals that of a young man. The improvement is still maintained after 6½ years.

3. A contractor, aged 64, who had suffered from difficulty of micturition for six months and had twice required catheterisation for retention. There was great hypertrophy of the prostate. Steinach's ligature II.

* The normal length of the prostatic urethra is 13 mm., but in hypertrophy it may attain 5 cm. or more. Heitz-Boyer noted after Steinach ligature II. a decrease in the size of the prostate and a shortening of the urethra, elongated by hypertrophy.

operation was performed on Jan. 9th, 1928. No indwelling catheter was necessary. The urine was passed more easily each day and after the twenty-third day the bladder was completely emptied. Since then he only passes urine once at night and has had no mishap or dysuria. The prostate is only slightly enlarged. He has now been under observation for eight years.

Conclusions

In the last few years I have done a very large number of ligature operations. They are painless and nearly all my patients have assured me that they have felt no discomfort either during or after operation. In cases without infection the length of treatment is 12 days and the mortality has been nil.

Since the operation entails no risk, the doctor can advise this treatment at the onset of prostatic trouble before there is any indication for prostatectomy. He may also advise it as a prophylactic against the changes in the interaction of the endocrines due to age and thus avoid hypertrophy of the prostate, a condition which untreated is always progressive. For the prophylaxis and treatment of senile changes in the prostate in the future the resources of endocrinology will be more and more utilised and in serious cases the patient will no longer have to choose between the use of the catheter and prostatectomy, to which operation the famous urologist Legue once referred as "a procedure which may prove fatal, but which will cure those it does not kill." Steinach's ligature II. can relieve a great many of the sufferers from prostatic enlargement however advanced their age without shock, pain, loss of blood, or risk.

CLINICAL AND LABORATORY NOTES

EFFECT OF THE HIGH-FREQUENCY FIELD ON SOME PHYSIOLOGICAL PREPARATIONS

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SINCE so-called ultra-short waves are being used extensively for medical treatment an explanation of their mode of action is required. Various authors have claimed that effects can be produced in the ultra high-frequency electric field which are not explicable on the basis of rise in temperature. A good review of the literature is given by Mortimer and Osborne.¹ One of the more important papers is by Haase and Schliephake,² who claim that a selective lethal action on various organisms is a specific action of ultra-short waves. This is denied by Hasché and Leunig.³ Many of the claims made for the specific action of ultra-short waves rest on the early work of Schereschewsky,^{4 5} who studied the effect of the ultra high-frequency field on mouse and fowl sarcoma and carcinoma. More recently Schereschewsky has published⁶ a review which includes his earlier work and says that no case can be made out for ascribing effects as not being directly due to heat. Reiter⁷ has, however, claimed that high-frequency currents of frequency 8.82×10^7 sec.⁻¹ corresponding to a wave-length of 3.4 m. destroy rat tumours by a specific effect distinguishable from that of heat. The method of cooling the animal employed by Reiter is open to criticism, and Taylor⁸ has shown that if a more efficient method of cooling

be employed no destruction of the tumour and surrounding tissues results, when these are exposed in the high-frequency field. Moreover, he found that a low intensity without cooling of the treated parts is as effective as a high intensity with which artificial cooling is employed; further, a frequency corresponding to 4.5 m. wave-length is just as effective as that corresponding to 3.4 m.

EXPERIMENTAL WORK

As an additional proof of the fact that the action of the 3.4 metre wave-length is due to heat we have exposed the excised frog heart in the high-frequency field, the heart being immersed in a small quartz vessel containing Ringer's solution. The temperature of this solution was taken at times with a thermometer, the vessel of course being removed from the field for the purpose. Strict accuracy is not claimed for this method, but as the heat loss from the quartz vessel and contents is slow no great error is introduced. It was found that the heart continued to beat normally until a temperature above 30° C. was reached. The heart then ceased to beat but might be restored by cooling until a temperature above 35° C. was reached, when the heart failed to recover. As the behaviour of the frog's heart was exactly as it is known to be when merely submitted to increasing temperature in a bath of Ringer's solution, we conclude that the result of exposure to the high-frequency field is wholly due to heat. In case it were argued the high-frequency field acted rather on the saline solution than on the heart, a preparation was made of the thorax of a large frog containing the heart in situ, and this was suspended by cotton threads in the field with the lower part of the thorax uppermost. The heart was covered by the liver and the temperature was taken by removing the preparation from the

field and inserting the thermometer between the liver and heart. Here again the heart ceased to beat when the temperature rose above 30° C. and could be restored by cooling until the temperature reached 35° C. A preparation was then made of the head of the frog after the removal of the lower jaw and tongue, so that the ciliated epithelium covering the roof of the mouth was exposed. The activity of the cilia was tested by placing some granules of iron dust upon it and timing the progress of them towards the opening of the gullet. This preparation, placed in Ringer's solution in the quartz vessel, was exposed in the field and taken out at intervals and tested for temperature and for movement of the cilia. The cilia continued to show activity up to a temperature of 42° C., stopped at a higher temperature, but started again on cooling if they had not been heated to a temperature higher than 45°; above this temperature they stopped for good. Similar results were obtained when the whole head was suspended in the field on a thread, the temperature was taken by inserting the thermometer in the mouth, when the field was switched off; the activity of the cilia was observed after opening the mouth. This result also agrees with the known effect of temperature on the ciliated epithelium of the frog. Next a nerve-muscle preparation was exposed in the field in a quartz vessel in the same way. This was taken out for testing at intervals. The muscle continued to contract vigorously on faradic stimulation of the nerve up to a temperature of about 42° C. undergoing heat rigor at 45° C.

CONCLUSION

The behaviour of frog heart, cilia, and nerve-muscle preparation exposed in the high-frequency field corresponding to 3.4 m. wave-length is shown to be exactly the same as when merely heated in Ringer's solution; the biological effect of the field is thus due to heat.

This research was carried out with the aid of a grant, for expenses, from the Medical Research Council.

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POLYCYSTIC DISEASE OF THE KIDNEYS

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THE case to be described has many unusual features.

History.—A. B., then 16 years old, was seen by her medical attendant in November, 1933. She complained of backache, lassitude, and dyspnoea on exertion. There was a considerable degree of anæmia. The urine contained large quantities of blood and pus, and bacteriologically *Bacillus coli* and *Staphylococcus albus*. There was no radiographic evidence of calculus, and the renal shadows were reported to be normal in size and shape, but after an injection of Uroselectan on Feb. 13th, 1934, none of the dye appeared in the renal areas at any time. She had appeared a healthy though under-developed girl until the onset of the symptoms. In October, 1933, she had had a very scanty menstrual period which lasted seven days, and was accompanied by a great deal of pain. This was the only period she had.

From November, 1933, to June, 1935, her condition fluctuated. The anæmia improved and for long periods the urine did not contain blood. She was able to take walks and carry on an apparently normal life.

Final illness.—On admission to hospital on June 23rd, 1935, at the age of 18, she was 4 ft. 7 in. in height and juvenile in appearance, with lack of development of secondary sexual characteristics. The blood pressure was 116/70 mm. Hg. The daily output of urine was 20–40 oz. until July 14th, the day before her death, when it was 2 oz. The specific gravity varied between 1004 and 1014, and the urine contained blood and pus. The blood-urea, ten days before death, was 700 mg. per 100 c.c.m., the serum calcium 6.7 mg., and the creatinine 3.4 mg. There was a progressive anæmia, the hæmoglobin falling to 30 per cent., with red cells 2,400,000 per c.c.m., colour-index 0.6, and the reticulocytes less than 0.1 per cent. The average diameter of the red cells was 7.3 μ . Total leucocytes were 16,000 per c.c.m. with a differential count of polymorphs 78 per cent., monocytes 4 per cent., and lymphocytes 18 per cent. The polynuclear count was: (I.) 6, (II.) 20, (III.) 40, (IV.) 22, (V.) 12. Bleeding from the gums was noticed about that time and a pericardial rub two days before death. The disease was apyrexial throughout.

POST-MORTEM FINDINGS

There was a fibrinous pericarditis with 2 oz. of serous fluid in the pericardium. The heart weighed 8½ oz. The liver, spleen, and pancreas were normal. The uterus was small and the ovaries unscarred. The bladder and ureters were normal, the pelvis dilated.

Kidneys.—Both kidneys were cystic. Each was 6 in. long, 3 in. wide, and 3 in. thick at the deepest part, and each weighed 15½ oz. The hilum notch was accentuated. The right kidney was translucent, the cysts being filled with a pale straw-coloured urine of specific gravity 1004, containing 0.5 per cent. of urea and a trace of albumin with a few pus cells. Many of the cysts of the left kidney were distended with blood-clot, some contained thick necrotic material and the remainder pale urine as in the right (Fig. 1). No tubercle bacilli were present and cultures gave *B. coli* and *Staph. albus*.

The adrenals were flattened and the normal contour lost. They were situated postero-internally immediately above the hilar notch, the external border becoming, with the altered position, anterior, the anterior surface postero-internal, and the posterior, antero-external. A considerable proportion of the kidneys was above their upper borders. They appeared, microscopically, normal.

Histology.—The small triangular areas at the junctions of the cysts presented the usual appearance of dilated ducts lined by cuboidal epithelium (Fig. 2). In the larger cysts this had become flattened. In the left kidney the renal tissue in these positions showed cloudy swelling of the tubular epithelium, tubules of unequal sizes, thickening of Bowman's capsule, and areas of round-celled infiltration (Fig. 3).

DISCUSSION

In addition to the abnormal situation of the adrenals, the unusual features of the case are:—

1. *Age.*—Oppenheimer¹ recording 59 cases of polycystic kidney gave the following ages when the condition was diagnosed:—

Years.	Patients.	Years.	Patients.
1–9	0	40–49	17
10–19	0	50–59	18
20–29	2	60–69	8
30–39	14		

Küster's² figures for 239 cases were:—

Patients.	Patients.
Stillborn or dying shortly after birth	30–40 years
.. 59	.. 24
Died in first year	40–50 "
.. 10	.. 53
1–5 years	50–60 "
.. 6	.. 41
5–10 "	60–70 "
.. 1	.. 10
10–20 "	70–80 "
.. 4	.. 6
20–30 "	80–90 "
.. 22	.. 3

Oppenheimer collected from the literature 29 cases between the ages two and twenty years and suggests that these represent the connecting link between the new-born and the adult types of the same disease. Until we know more about the ætiology his contention

cannot be confirmed nor refuted, but his own and Küster's figures are remarkable in emphasising the rarity of the condition between the ages of one and twenty and the greatest incidence in the 30-60 age-group.

2. *Infantilism.*—The terms renal dwarfism, renal infantilism, and renal rickets have been used synonymously, but as Ellis and Evans³ point out, many cases fall clearly into one of these groups and should be differentiated. The present case would be placed into the group of renal infantilism. The rarity, in fact total absence, of dwarfism, rickets, and infantilism recorded in connexion with polycystic kidneys in contrast with their frequency in cases of contracted kidney and hydronephrosis and dilatation of the ureters occurring before puberty may be explained by the fact that serious diminution in the amount of effective renal tissue in the former disease does not usually take place until after twenty years of age. Although it is difficult to believe on viewing cystic kidneys, the two-thirds of renal substance necessary to life (reduced now by some workers to

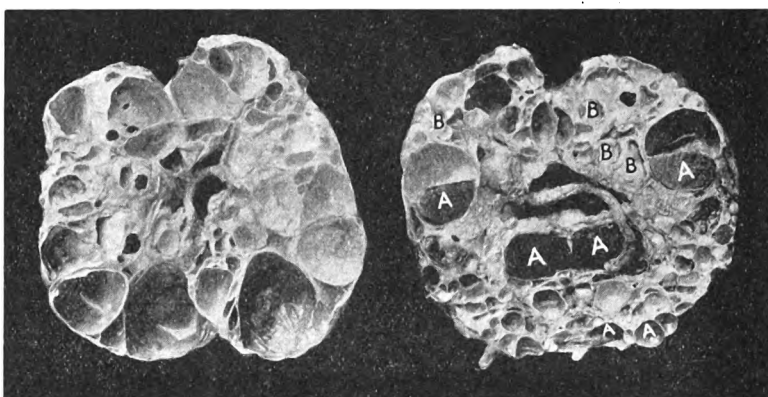


FIG. 1.—Photograph of the polycystic kidneys, sectioned, described in text. The right kidney was transparent, the cyst containing a pale yellow urine. The left shows some of the cysts filled with blood-clot at A, others filled with necrotic material at B. The cysts that appear empty in the photograph contained pale yellow urine. The ureters are seen in the centre of each kidney. (× 1.)

relationship between anæmia and renal insufficiency. They attribute the anæmia to a disturbance in hæmopoiesis. This is also suggested by the blood in the present case. Two factors may have been jointly responsible for the progressive anæmia—renal insufficiency and infection of the kidneys.

But the polynuclear count points to some radical dysfunction either in the production or elimination, or alteration in the life-history of the polymorphs. The right-handed polynuclear count—(I.) 6, (II.) 20, (III.) 40, (IV.) 22, (V.) 12—giving a weighted mean of 3.14 is remarkable in itself in a case with a gross infection, still more so with a leucocytosis of 16,000 per c.mm., and is in my experience unique. The polymorphs generally were of normal size, but macro-polycytes were not infrequently seen (Fig. 4). The lobes of the nuclei were so

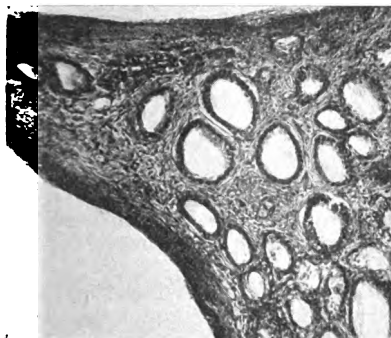


FIG. 2.—Photomicrograph of tissue between cysts, showing dilated tubules lined with cuboidal epithelium. The epithelium lining the larger cysts on each side of the triangular piece of tissue is flattened. (× 75.)

Photomicrographs by C. F. Hill and W. E. Cooke.



FIG. 3.—Photomicrograph of renal tissue from left kidney, showing thickened Bowman's capsule, variation in size of the tubules, and at × an area of round-celled infiltration. (× 75.)

one-sixth) must have functioned over the period of puberty.

3. *Blood analysis.*—The blood-urea, 700 mg. per 100 c.cm., was the highest I have seen. The serum calcium fell from 10.8 to 6.7 mg. a few days before death. The amount of creatinine was unusually high.

4. *Blood count.*—Brown and Roth⁴ stressed the

numerous and the fragments so contorted and superimposed as to make the count the most difficult I have encountered. Figs. 5, 6, and 7 were taken from almost successive fields in a blood film and will afford some idea of the task.

Similar counts are recorded in pernicious anæmia,⁵ but in that disease the polymorphs tend to be larger

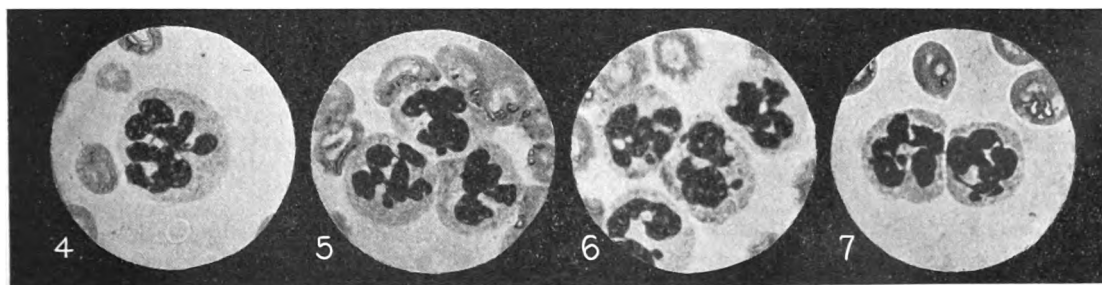


FIG. 4.—A macropolycyte of type 1 illustrating large size of cell and hypersegmentation of the nucleus. (× 1000.)
FIGS. 5 to 7.—Three almost successive fields in a blood film illustrating polymorphs with hypersegmented nuclei, and the difficulties encountered in making a polynuclear count. (× 1000.)

and the basichromatin in the nucleus less in amount and therefore less densely staining than in the present case, so that the contortions and divisions are more easily followed.

SUMMARY

(1) The case is one of polycystic kidney associated with infantilism. (2) Although gross infection of the renal cysts was present, the case was apyrexial throughout. (3) The blood-urea reached the high figure of 700 mg. per 100 c.cm. of blood. (4) The

polynuclear count was right-handed. (5) The anatomical position of the adrenals was abnormal.

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MEDICAL SOCIETIES

ASSOCIATION OF CLINICAL PATHOLOGISTS

THE ninth annual meeting of this association was held, by the courtesy of Sir Henry Wellcome, at the Wellcome Physiological Research Laboratories, London, on Jan. 25th. Dr. J. G. GREENFIELD occupied the chair.

Dr. I. MUENDE (London) spoke on the

Clinical Pathology of Skin Diseases

with particular referencé to parasitic and fungal infections. He pointed out that in acarus infection of human type the rash might be widespread and the manifestations varied but that the characteristic burrows would be found between the webs of the fingers, on the glans penis, in the axillary folds, and in women under the breasts. The parasite could be demonstrated by shaving off the skin at the end of the burrow and examining under the microscope. In infection derived from pet animals type burrows might be missing; the eruption was usually confined to the hands and arms and would disappear on removal of the infecting pet. In fungal infections the speaker laid stress on the identification of the type, which was best done by culture; in those acquired from cat, dog, or canary, removal of the source of infection was essential. Kerion was usually due to animal infection. The black dot type of ringworm was becoming much more common; in this type the extraction of hairs for examination presented difficulties which were best met by the use of a comedo extractor. Achlorion infection might be acquired from mice, in which animals it produced a fatal encephalitis. Dr. Muende recorded one case which had been associated with an epidemic among mice in the place of work. Moniliasis was a not infrequent cause of paronychia; the fungus could be identified by scrapings taken from under the nail bed even in the absence of pus; it was particularly prone to occur in barmaids, bakers, and pastry cooks. Dyshidrosis was due to sensitisation to a fungus infection usually by an epidermophyton between the toes. A useful guide to the presence of such sensitisation was the reaction produced by the intradermal injection of the soluble products from a culture of mixed fungus of the same type. Eczema might be due to sensitisation to vast numbers of "eczematogens"; Dr. Muende described the "patch test" for the identification of such sensitisation.

Dr. C. M. WENYON, F.R.S. (London), spoke on the clinical pathology of

Protozoal Infections

He said that, though amœbic dysentery was probably not so common in this country now as in the years immediately succeeding the war, numerous carriers of pathogenic amœbæ still existed. Many of

these carriers were not aware that they had ever had amœbic dysentery and many of them experienced very little inconvenience. Amœbæ might be found in vast numbers in the stools of those with very little in the way of symptoms and this had led some people to conclude that there were two types of histolytic amœba, one type (called "dispar") being of relatively low pathogenicity. Dr. Wenyon discussed the difficulties in the identification of amœbic infection and emphasised the necessity of examining fresh specimens of feces; repeated examination might be necessary and protozoa were rarely found in very liquid feces. Amœbæ might be found in scrapings taken from ulcers through a sigmoidoscope when they could not be found in the feces. All intestinal parasites except giardia could be cultivated, but this method was only possible in institutions dealing with very large numbers of cases. Giardia was an inhabitant of the duodenum and could be obtained by means of duodenal intubation; cholecystitis had been ascribed to it but Dr. Wenyon did not regard the case as proven. In the diagnosis of protozoal blood infections a good stain was the first requisite. Except in the case of kala-azar culture was of no use as a diagnostic measure. In the diagnosis of bilharzia and schistosoma infestation a useful aid was the intradermal injection of the appropriate antigen.

Dr. G. W. GOODHART (London) pointed out that, while diagnosis of trichomonas infection of the vagina could be made from fresh secretion, the parasites could not be demonstrated in dried films.

Dr. R. V. FACEY (Bournemouth) stated that he came across large numbers of cases of vaginal trichomoniasis and that these responded readily to treatment with arsenical pessaries.

Dr. H. P. HIMSWORTH (London) spoke on the

Significance of Blood-sugar Levels in Diabetics

He asked why the blood-sugar rises in diabetes? The classical explanation is failure in carbohydrate storage. He however suggested that the rise of the blood-sugar was a compensatory phenomenon. He showed graphs indicating the course of the blood-sugar and of the ketosis in a severe case of diabetic coma; when sugar was given in large amount without insulin the blood-sugar rose but the ketosis became less; he cited an instance of diabetic coma in which the blood-sugar had been forced up by the administration of glucose to over 1000 mg. per cent. with decrease in ketosis and corresponding improvement in the clinical condition. On giving sugar to the diabetic more sugar was excreted than was taken; similarly the establishment of diuresis, though it had no effect on the blood-sugar level, would result in increased excretion of sugar. He suggested that the main factor in diabetes was an incapacity to utilise carbohydrate until the blood-sugar had risen to a

certain level above the normal; on this account it was harmful to withhold sugar from the diabetic. The level of the blood-sugar bore no relation to the clinical condition.

Dr. S. C. DYKE (Wolverhampton) expressed his agreement with Dr. Himsforth that more harm was done by withholding than by giving excess of sugar to the patient in diabetic coma, but pointed out that a high blood-sugar encouraged diuresis and therefore favoured the further dehydration of the patient; dehydration was the main danger in coma and reduction of the blood-sugar was a necessary step in combating it. In the established diabetic he asked whether continued hyperglycemia might not be one of the causes of the vascular degeneration which is the main cause of morbidity.

Dr. J. A. BOYCOTT (London) described the

Diagnosis of Teratoma Testis

by means of the Aschheim-Zondek reaction. The method depended upon the fact that sufferers from malignant tumours of testis excrete in the urine excessive amounts of gonadotropic hormone; this was not the case with simple and inflammatory tumours. Two sets of mice were used; one series received graduated injections of concentrated and the other of unconcentrated urine. By means of a table it was possible to calculate the amount of gonadotropic hormone excreted. The test was useful not only in diagnosis but also in controlling the results of operation and radiotherapy.

Dr. DYKE also described a case of accidental transmission of malarial infection in the course of blood transfusion; the donor had lived in India but had never known that he had had malaria.

In the course of the afternoon Dr. S. H. Daukes, curator of the Wellcome Museum of Medical Science, conducted members round the magnificent medical museum of the institution.

GLASGOW OBSTETRICAL SOCIETY

At a meeting of this society on Jan. 22nd Dr. JOHN GARDNER, the president, took the chair, and Dr. DUGALD BAIRD read the paper published on p. 295 under the title of

Maternal Mortality in Hospital

In the subsequent discussion Dr. J. DUNLOP said he did not accept the nasopharyngeal origin of puerperal sepsis, and attributed his own improved results in general practice to the use of gloves. He thought many errors in judgment resulted from overtiredness, after a long day in practice. He agreed that spacing of births was most desirable, and put in a plea for birth control clinics run by the local authority.

Dr. JAMES COOK thought that uterine inertia was often due to over-indulgence in strong tea. He was alarmed at the increased number of Cæsarean sections and asked why induction was not performed more often. He was in favour of a great extension of antenatal care, and advocated medical examination before marriage.

Dr. A. S. M. MACGREGOR (M.O.H. for Glasgow) was not convinced that there was an increase in the maternal mortality for Scotland, the apparent rise being due to more accurate certification and statistical fallacies. There seemed no doubt that technical practice was improving. He thought that an analysis such as Dr. Baird's, where each case was assessed individually, was the best method of

studying the problem. The incidence of sepsis in Scotland had not diminished in the last few years, especially that of sepsis due to the hæmolytic streptococcus, and he believed that this might be explained by the increased virulence of the hæmolytic streptococcus in northern latitudes. He thought the non-coöperation of patients themselves was an important factor in maternal mortality. He asked if Dr. Baird would put greatest emphasis on the provision of antenatal beds in a government policy.

Dr. DOUGLAS MILLER advocated Cæsarean section in those cases of uterine inertia with stigmata of endocrine deficiency. He said they had been disappointed with the results of the use of masks in Edinburgh, and asked if some of the improvement in Glasgow was not due to more careful segregation of "suspect" cases.

Prof. SHAW DUNN remarked that antenatal care had not altered the incidence of albuminuria, since this condition probably depended on intimate physiological and dietetic causes, occurring early in pregnancy.

Prof. JAMES HENDRY thought that much of the improvement in results at the Royal Maternity Hospital was due to the reorganisation of the staff which allowed continuous service and team-work, and to better coöperation with the general practitioner and local authority. The extended use of Cæsarean section in the treatment of placenta prævia was a great advance.

Dr. BAIRD replied that he did not attribute the fall in the sepsis-rate to better segregation. The most striking fall occurred in sepsis following spontaneous delivery, which, as Colebrook had shown, was almost always due to the hæmolytic streptococcus, in contrast to sepsis following abnormal labour, where the hæmolytic streptococcus was the causal organism in only 30 per cent. There was little evidence of infection being transferred from one patient to the other, for the cases of sepsis were sporadic and infection seemed to take place at the time of labour. He was convinced of the nasopharyngeal source of infection by the hæmolytic streptococcus. He certainly thought that more antenatal beds should be an important feature of a government plan; but great tact was often necessary to persuade the patient to stay in hospital.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY

At the annual meeting of this society, held in Manchester on Jan. 24th, with Dr. RUTH NICHOLSON, the president, in the chair, a paper on

Extroversion of the Ovaries for Secondary Functional Amenorrhœa

was read by Dr. K. V. BAILEY. Recent advances in endocrine therapy, he said, had done much to simplify the treatment of many uterine disorders, and Kaufmann's work had undoubtedly established a rational treatment for functional amenorrhœa. But even the large doses of hormones used by Kaufmann gave irregular results and Dr. Bailey thought it desirable to bring forward an operative treatment he had adopted in 16 cases during the past five years, especially as its results indicated a probable cause for the relative failure of endocrine therapy in some cases of secondary amenorrhœa. In this condition uterine junction had once been present, and the true failure was probably in ovary or

pituitary. As a rule, the patient was otherwise healthy and well developed, showing no sign of gross endocrine imbalance. In the ovaries themselves lack of follicular ripening and ovulation might lead to multicystic disease or to chronic cirrhosis of the tunica with progressive fibrosis of the ovarian stroma—findings most readily attributable to a basic pituitary deficiency. Once established, these changes were permanent; although ovulation might occasionally be induced in an ovary showing advanced multicystic disease, it could only occur in a small area which still functioned and found an outlet to the surface. Regeneration was as impossible as in a multicystic kidney. The operation he had adopted was based on these facts and sought to assist maturation and ovulation in the remaining follicles by facilitating their approach to the surface. It might seem to break the rules of surgery, because a raw surface was deliberately produced in the pelvic cavity, but this raw surface faced downwards towards the pouch of Douglas and was not in contact with any peritoneal surface. What he did was to excise a wedge of tissue sagittally from the cystic or cirrhotic ovary, with its apex at the hilum; then by means of sutures the organ was turned almost inside out—or, more accurately, the cut halves were flattened outwards. In no case had Dr. Bailey seen post-operative adhesions or symptoms attributable to them, and he now looked on the operation—which he usually preceded by dilatation and curettage—as thoroughly safe. Endocrine treatment had been given in addition, including Antuitrin S, but judging by control cases the doses were too small to have any effect per se, though they might stimulate follicular growth, to the stage of ovulation, in the extroverted ovary. Of the 16 cases treated, the duration of the amenorrhœa had been over six months in 4, over a year in 4, and over two years in 3; there were also 5 cases with a constant periodicity of two to six months. Regular menstruation had been established and continued in 12 of the 16 cases, the operations being performed in 1932 (1 case), 1933 (1), 1934 (4), and 1935 (6). Of the 4 other patients, 1 had begun to menstruate three years after operation, 2 had had single periods, and 1 had not yet menstruated at all; in these 4 cases the initial amenorrhœa had lasted, respectively, one year, seven months, six months, and two years. In 2 of the successful cases other treatment (including curettage and administration of antuitrin S or œstrin or both) had been given for three months before operation without effect. On one occasion, Dr. Bailey said, he had seen at laparotomy an ovary which had been resected and repaired a few months previously. Surface healing had taken place by the formation of a thin red and wide scar—much more delicate at that stage than the tunica albuginea itself—and it was probable that a similar scar formed on the cut surface of the extroverted ovary, which would easily allow of ovulation. Though adequate hormone therapy should always be attempted where possible, and might be successful where amenorrhœa had not been too prolonged, he believed that the operation described might be helpful in cases which proved otherwise resistant.

Mr. J. E. STACEY said that the late Mr. King had performed a similar operation on a number of cases of dysmenorrhœa in the presence of cystic ovaries. He was inclined to think it would be more useful for that condition than for secondary amenorrhœa.—Prof. D. DOUGAL thought the operation very drastic if the patient was young and if the amenorrhœa was only of six months' standing. Periods of

amenorrhœa of this length were by no means uncommon in young unmarried women.—Mr. T. N. A. JEFFCOATE said there were really three types of amenorrhœa: (1) where the ovary was not functioning as an endocrine organ; (2) where there was persistence of the œstrin phase; and (3) where there was persistence of the lutein phase. A differential diagnosis could be obtained by the examination of curettings, and the condition might be relieved in a number of ways—e.g., by injections of anterior pituitary hormone, by mental shock, or perhaps as a result of the shock of an operation.—Dr. D. C. RACKER considered that a persistently low blood œstrin was sometimes a factor in the production of amenorrhœa of this type.—Dr. BAILEY, in reply, agreed that operative treatment was certainly drastic but felt that it had a definite place where other methods had failed.

Granulosa-cell Tumour

Prof. DOUGAL said that during the last ten years there had been a revival of interest in certain ovarian tumours which had a hormonal influence on the sexual characters of the host. These tumours were derived from undifferentiated cells in the ovarian mesenchyme which though not utilised during embryonic development still retained their powers of growth and later in life were able to proliferate and form new growths. If the sexual influence of these cells was towards masculinity the tumour was known as an arrhenoblastoma; if towards femininity, as a granulosa-cell tumour; and if neutral, as a dysgerminoma. He described the case of a married woman of 41 who complained of excessive and too frequent menstrual loss, and who had a large solid abdominal tumour indistinguishable clinically from a uterine fibroid. At operation the tumour was found to be ovarian and was removed, the uterus and the other ovary being left behind. Microscopically it proved to be a very large granulosa-cell tumour composed of large numbers of alveoli containing round cells with deeply stained nuclei. Commenting on this case Prof. Dougal pointed out that granulosa-cell tumours are usually unilateral and have a very low degree of malignancy, if they are not actually benign. They may develop at any period of life and their biological influence is due to excessive secretion of œstrin. Therefore, if the tumours develop before puberty sexual precocity is the result; if during the reproductive period, excessive and too frequent menstrual loss; and if after the menopause, post-menopausal hæmorrhage.

The discussion which followed centred round the distinction between the granulosa-cell tumour and the Brenner tumour, which is derived from Wolffian relics in the hilum of the ovary. Mr. JEFFCOATE held that their distinction on histological grounds must be very fine and that a physiological basis would be more satisfactory—i.e., if a tumour produced œstrin, and consequently a disturbance of the menstrual cycle, it was a granulosa-cell tumour, while if it did not it must be a Brenner tumour.—Prof. DOUGAL said he was inclined to agree.

Dr. J. W. BRIDE described three cases of hydro-peritoneum secondary to ovarian tumours, and showed a specimen of malignant Fallopian tubes.

Corrigendum.—Mr. A. W. Cubitt points out that the remarks attributed to him on p. 260 of our last issue were made by a subsequent speaker.

REVIEWS AND NOTICES OF BOOKS

Outlines of General Psychopathology

By WM. MALAMUD, M.D., Professor of Psychiatry, State University of Iowa. London: Chapman and Hall. 1935. Pp. 462. 21s.

A SYSTEMATIC account of psychopathology, such as is here supplied, is greatly needed by the beginner in psychiatry. Presentations of the theory of this or that school abound, but for an ordered arrangement of the known data and the less debatable explanations for their occurrence the reader has had to turn to the translation of Kretschmer's text-book of medical psychology, itself disproportionate in so far as it reflects the personal investigations and interests of its author. Prof. Malamud's book is well balanced and non-controversial. Through having worked in Heidelberg he is familiar not only with the holistic method of von Weizsäcker's earlier phase but also with the phenomenology of Jaspers, to whose more detailed and formal treatise he is clearly indebted. Chief, however, among those whom he mentions as his guides, one sees Adolph Meyer whose salutary refusal to guess overmuch is a sure guard against the common faults of psychopathologists.

The book begins with a plain definition of psychopathology and discussion of its relationships and limitations, the fields in which it may be applied and the material upon which it draws. The next part describes and analyses the phenomena under the general heads: behaviour and experience. The various determinants in pathogenesis are next examined in turn, the structure of personality is discussed, and the synthesis of abnormal functions in the various types of morbid reaction is illustrated, in the last part of the book, by clinical material. In spite of its length the work is properly named: it is only a framework or outline, in which the experienced psychiatrist must not expect to find recondite problems or much detail. The difficulties of the author's task have been so well overcome that it would be unjust to reproach him for omissions that are judicious and doubtless intentional.

Immunology

By NOBLE PIERCE SHERWOOD, Ph.D., M.D., Professor of Bacteriology, University of Kansas, and Pathologist to the Lawrence Memorial Hospital, Lawrence, Kansas. London: Henry Kimpton. 1935. Pp. 608. 25s.

THIS is a laboriously and conscientiously produced volume which covers the main ground of immunological science. Such subjects as cellular immunity, serological tests, blood grouping, the chemistry of antigens, and hypersensitiveness are treated in detail and the analysis of a large body of immunological literature is made available. At times the "scissors and paste" method of compilation is unduly obtrusive, but some chapters, notably those on hypersensitiveness, are well done and the author clearly speaks from his own experience. Among the less satisfactory chapters are those on toxin and antitoxin. Here Prof. Sherwood seems to tread with a somewhat uncertain step, though the subject is a fundamental one in immunology. We were unable for example to find any clear description of the present unit of diphtheria antitoxin: the accounts given on pages 116 and 212 are inadequate not to say misleading. The sections on active immunisation against diphtheria also seem to have been compiled

somewhat uncritically. It is surprising to find the expressions "*C. diphtheria*" and "*Cl. botulinus*" repeated in several places in an otherwise carefully written book. To the instructed reader the book will prove of considerable value as it covers in well-expressed summaries a large amount of modern immunological literature, particularly that of American origin, and provides full references to original sources.

The Foot

By NORMAN C. LAKE, M.D., M.S., D.Sc. Lond., F.R.C.S. Eng., Senior Surgeon and Lecturer on Surgery, Charing Cross Hospital. London: Baillière, Tindall and Cox. 1935. Pp. 330. 12s. 6d.

DISORDERS of the feet, which are extremely common, have been treated lightly by the medical profession until recent years, to the profit and satisfaction of unorthodox practitioners and the vendors of patent remedies. Painful feet, to which doctors and nurses are especially prone, are liable to alter the whole outlook of the individual and make work a burden. It behoves us therefore to study their causation and treatment with minute care. This book is intended for the practitioner and general surgeon, perhaps for the masseur and chiropractist, and does not deal with elaborate orthopædic details, which can be studied elsewhere. Enough about the evolution, anatomy, and physiology of the foot is presented in readable form to make a foundation for the later chapters dealing with the aetiology and treatment of its common disorders. One chapter is devoted to foot-wear, and one to the mechanism of walking, in relation to the weakness of the modern foot. Needless to say, woman's footwear receives just criticism. The commoner operations recommended are briefly described in a separate chapter, and methods of anaesthesia are discussed. The old anatomical terminology is used throughout (except for one or two mistakes), but it would be to the advantage of future generations of students if the terminology of the Anatomical Society of Great Britain, now used in two or three text-books, could be adopted in future editions. It is difficult to understand why anatomists and surgeons should speak different languages. There are some printer's errors which should also receive attention in a future edition.

The book can be strongly recommended as an excellent exposition of disorders of the feet.

Experimental Physiology

By M. B. VISSCHER, Ph.D., M.D., Professor of Physiology in the University of Illinois, Chicago; and P. W. SMITH, Ph.D., Associate in Physiology in the University. London: Henry Kimpton. 1935. Pp. 191. 15s.

LIKE most practical physiology text-books this is based on a course of experiments made by the students of a particular medical school. Such courses have much in common, and the authors here are careful to make no claim for originality in their subject matter presented. In this they are modest, for we have not seen in other books simple instructions for the demonstration of experimental polyneuritis in the pigeon, or for the observation of the oestrous cycle and the gonadotropic (wrongly called oestrogenic) properties of pregnancy urine. Experiments are suggested for every "system" of the body, and the

frog muscle experiments are cut down to suitable proportions. The only criticism with regard to allocation of space is that the nervous system and the special senses are perhaps over-represented. The instructions are clear and concise, and no teacher will read through the book without picking up useful technical hints. An unusual feature is that the illustrations are nearly all photographs, a road to perfection which most authors have abandoned as being too full of pitfalls. In this case the experi-

ment is justified, the lay-out of the apparatus and the photography being excellent. The last chapter is an appendix on methods, preparations, apparatus, dosage of drugs in animal experiments, and so forth, and is of real value. Selected references to original papers and reviews are given throughout. The general impression left by the book is that of a well turned-out and practised piece of work with no loose ends, and the publishers as well as the authors deserve praise for its production.

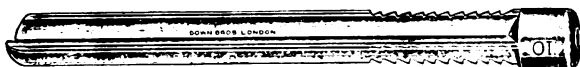
NEW INVENTIONS

INSTRUMENTS FOR USE IN OPERATIONS UPON FRACTURES OF THE NECK OF THE FEMUR

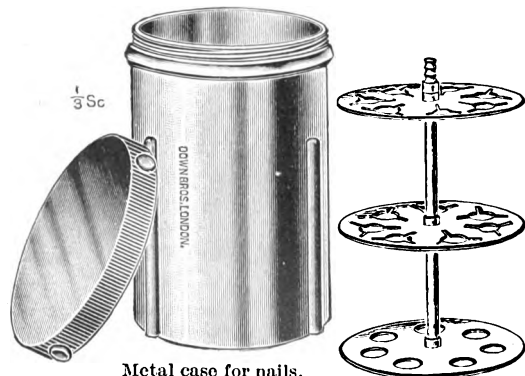
THE following instruments have been designed for use in operating upon fractures of the neck of the femur by the lateral approach.

LLOYD-KING NAILS (Modified from Smith-Petersen)

These stainless steel nails are a modification of the Smith-Petersen triradiate nail and are designed for



use with Eric Lloyd's director, though they are equally suitable for any other method of operating upon fractured necks of the femur. The nails differ from the standard design in the following particulars: 1. The head is twice the usual thickness, being 1 cm. deep, and is traversed by a threaded hole 6 mm. in diameter. 2. The nails are made in seven lengths from 7 cm. to 10 cm. with an interval of 0.5 cm. between each consecutive pair. 3. The length of each nail (excluding the head) is engraved on the head and no engraving is permitted on any other part of the nail. 4. Each of the three flanges is snagged like the edge of a saw for 3 cm. adjacent to the head. This is intended to counteract any tendency for the nail to come out when it has once been inserted. 5. One of the three flanges is made 3 mm. shorter than the others. This shorter flange



Metal case for nails.

is directed proximally when used with Eric Lloyd's director. 6. The nails are made in two diameters—viz., the ordinary standard 13 mm. and a larger one of 16 mm.

STERILISABLE METAL CASE FOR LLOYD-KING NAILS

This is a strongly made metal cylindrical case with a screw-top lid. It contains a cruet stand

fitting, which is made to take one set of seven Lloyd-King nails of 13 or 16 mm. diameter. The case is half filled with water and the lid screwed down half a turn before boiling the nails. Thereafter, no handling is necessary, and as the length of each nail (excluding the head) is engraved on the outside of the head it is easy to find the desired length of nail. Moreover, the absence of any one of the seven sizes of nail is immediately noticed if they are kept in this case.

LLOYD-KING NAIL INTRODUCER

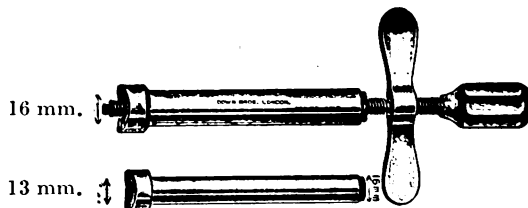
This is a threaded stainless steel rod which screws into the head of the nail. It is used to pick out the selected nail from the sterilised case containing the set of seven and to start the nail the first few millimetres into the cortex of the great trochanter. All temptation to handle the nail is thus removed, and



the short flange of the nail can be placed in the correct orientation during introduction. As soon as the nail has started on its course the introducer can be unscrewed and an ordinary punch used to complete the nailing.

LLOYD-KING NAIL EXTRACTOR

The removal of triradiate nails may be extremely difficult and some patterns of extractors necessitate full exposure of the whole head of the nail and even a portion of the shaft before the instruments can be engaged. This extractor screws into the head of the nail and considerably simplifies removal, inasmuch as exposure is minimised. It was described by Thomas King, and is here modified in three respects: 1. The engaging screw is much longer and of larger



diameter. 2. A single extractor will remove nails of either 13 or 16 mm. diameter. 3. A larger and more convenient screw handle has been supplied.

These instruments have all been made for me by Messrs. Down Bros., Ltd., St. Thomas's-street, London, S.E., but the director (described in THE LANCET, 1935, ii., 129) is made by the Medical Supply Association.

ERIC I. LLOYD, M.B. Camb., F.R.C.S. Eng.

THE LANCET

LONDON: SATURDAY, FEBRUARY 8, 1936

SAFETY *versus* COMFORT IN CHILDBIRTH

THE large majority of confinements are now attended by a midwife and it can hardly be long before every expectant mother will require the attendance of a woman whose experience and responsibilities are legally defined. In 40-50 per cent. of the cases she attends the midwife calls in a doctor, and in a proportion of confinements which varies from 10-70 per cent. in different parts of England a doctor has been previously retained by the expectant mother; but this leaves many women who cannot expect any alleviation of the pains of childbirth except what they can get at the hands of a midwife. Fifteen years ago the Home Secretary gave every midwife who has notified her intention to practise the right to carry in her bag Dover's powder and laudanum as well as chloral and bromide; with these the midwife working alone has been able to ensure rest and relaxation for the anxious and restless patient. The injunction of the Central Midwives Board that no drug should be used by a midwife unless she has been thoroughly trained in its use and is familiar with its administration seems to have been conscientiously followed. But none of these sedatives is effective in the second stage of labour, and four years ago Miss E. M. PYE suggested and Mr. L. C. RIVETT worked out the use of chloroform in the form of 20-minim capsules, to be crushed and administered by the midwife, or by the woman to herself, during brief periods of severe pain as they arise. Under the leadership of Mrs. STANLEY BALDWIN the proposal was taken up warmly by the National Birthday Trust Fund, which was then financing the provision of qualified anaesthetists in maternity wards, and at a festival dinner of the British College of Obstetricians and Gynaecologists Mr. BALDWIN said he wanted to see the day come when the best form of anaesthesia should be within the reach of every parturient woman. In reply, Dr. J. S. FAIRBAIRN, speaking as president of both Board and College, pleaded that he was ground between upper and lower millstones—between those who would trust the midwife with any available anaesthetic, and those who hesitated to place dangerous weapons in the hands of women not qualified to use them. What, he said, was needed was a scientific clinical test on a large scale, for the method adopted must be without increased risk for mother or child. This is in brief the origin of the investigation into the use of analgesics in midwifery, the report of which appeared last week and was summarised in our columns (pp. 282-3). The subcommittee of the College entrusted with the investigation consisted at first of Dr. FAIRBAIRN, Mr. EARDLEY HOLLAND,

Prof. FLETCHER SHAW, Mr. RIVETT, and Mr. CHRISTIE BROWN. Later Mr. G. F. GIBBERD was co-opted to assist in drawing up the forms of record, Dr. Z. MENNELL to advise about the analgesics employed, Prof. E. MELLANBY as nominee of the Medical Research Council, and Dr. MATTHEW YOUNG for expert statistical help. The investigation was a wide one; 36 hospitals in various parts of the British Isles took part in it, and they were kept in touch by supervisors prepared to clear up doubts as to the purpose of the investigation and to give instruction in the use of the standard methods. Although the special reference was to the use of chloroform capsules by midwives the investigation was widened to cover the efficacy and safety, in the hands of various groups of administrators, of nitrous oxide, of paraldehyde, and of chloroform given in three different ways.

On all these methods of producing analgesia the committee have come to definite conclusions, on which equally definite recommendations are based. The ground can at once be cleared of paraldehyde per rectum because "it does not provide adequate analgesia at the time of the actual birth." Gas and air administered by the Minnitt apparatus "is a safe and satisfactory method of producing analgesia, although the apparatus is expensive and the nitrous oxide costly"; its use should be "extended to the practice of midwives, provided they are specially trained in its administration." Chloroform, on the other hand, given by any method, "should not be used by midwives acting alone. This conclusion," the report says, "has been reached with regret, but both immediate and delayed dangers, which are well recognised, occurred in this investigation, and it is not possible fully to guard against such occurrences if the administration of chloroform is in inexperienced hands. This finding should not, however, be taken as prejudicing the use of chloroform by registered medical practitioners, who, aware of the dangers, can take precautions to lessen the risks." These recommendations it will be noted bear on the question of safety rather than on that of efficacy, for, to repeat Dr. FAIRBAIRN'S words, the method adopted must be without increased risk for mother or child; but it is interesting to note the high degree of efficacy both in gas-and-air and chloroform analgesia, no matter what the method or agent of administration. The proportion of patients who obtained satisfying relief from pain varied from 79 up to 94 per cent.; it was 84 per cent. for chloroform capsules administered by the midwife (in 695 reported cases). This method which was the primary object of the investigation is therefore well justified by the relief afforded, and it is natural to inquire more closely into the reason for the conclusion that it should not be used by midwives acting alone.

Among a total of 4975 cases in which chloroform was given by various methods to produce analgesia, with or without general anaesthesia, 6 mothers died; and these deaths were studied in detail. In 3 of the 6 the conclusion is reached that chloroform was in no way responsible for death;

in 2 it was an important factor in the fatal issue; and in 1 chloroform was directly responsible for death. This last case was the only one in which chloroform was given in the form of capsules. The patient was a primigravida, 21 years of age, with well compensated mitral disease, who had received a standard dose of paraldehyde and late in the second stage was given chloroform capsules by a medical student. When the head was about to be born the woman became difficult to control and six capsules were used within two minutes. This death, says the report, illustrates that chloroform capsules are not foolproof and shows that the display of precise instructions as to dosage is not a sufficient safeguard against misuse, even in hospital. It will be noted however that the report contains no evidence of harm being done by chloroform capsules to any woman in normal health, nor of any harm being done by chloroform capsules given by a midwife, or even by a pupil midwife. On the other side we have a statement to the Birthday Fund in 1933 that among 4000 patients who had capsules at Queen Charlotte's and Middlesex Hospitals there was no maternal death, while out of every 100 women 90 obtained some, and 50 very great, relief. Commenting on these figures Mr. RIVETT declared that "this is a completely safe and foolproof method of relieving the intense pains of childbirth and one which is easily learned at a very short course of instruction"; and if the committee have obtained evidence which reverses this verdict, they have not produced it. It was already common knowledge that some patients given chloroform capsules are noisy and difficult to control during the second stage, but so far as we are aware this has never led a midwife to disobey instructions and crush capsules so freely as to produce an over-concentration of chloroform vapour. In the other two fatal cases in which chloroform was blamed it had been given for prolonged periods by the Mennell inhaler and was later pushed to full surgical anaesthesia, the illness being typical of the diffuse acute necrosis of the liver which occasionally follows the administration of chloroform. For example, in his analysis of 999 fatal cases in a Glasgow maternity hospital (see p. 295 of this issue) Dr. DUGALD BAIRD finds that delayed chloroform poisoning was the sole cause of death in 5 forceps deliveries after long labour. The report admits that it was the full surgical anaesthesia rather than the preliminary analgesia which was the important factor in the cause of death, but regards the previous prolonged analgesia as weighting the balance against recovery. Whatever lesson is to be drawn from these cases against the use of deep chloroform anaesthesia in obstetric operations when so safe an anaesthetic as nitrous oxide is available, they seem again to have little if any bearing on the safety of a limited number of chloroform capsules, spaced at intervals of not less than five minutes, in the hands of a midwife acting alone.

But while the report is clear that chloroform by any method should not be used by midwives acting alone, it recognises that the administration of gas and air is a safe and satisfactory means of

producing analgesia, and recommends its extension to the practice of midwives under proper controls. Unfortunately, as we have seen, the committee find themselves obliged to lay stress on the expense of the apparatus and the costliness of the nitrous oxide. The expense of the apparatus is not arguable, but the cost of the gas in the investigation was enhanced by wastage "owing" it is said, "to the fact that, as the apparatus is now constructed, leakage may occur at many places unless constant attention is given to minor adjustments." It seems that in the investigation itself the leakage in question assumed such proportions as to invalidate any estimate of the cost of gas-and-air administration per patient; but we should like to call attention to the experience of Dr. J. ELAM, as set out in our own columns a few weeks ago (THE LANCET, 1935, ii., 1253), in which particular attention was paid to the competence of the midwife to administer gas-and-air analgesia and to the cost of the case itself. At the Wellhouse Hospital, Barnet, midwives have been trained to use gas and air for their own patients, the only trouble met with in district work being to decide when to start the administration, a difficulty which was soon overcome in practice. Dr. ELAM was satisfied that the cost of nitrous oxide per case at Barnet was working out at about two shillings.

A NEW INSULIN COMPOUND

In treating endocrine deficiencies with glandular extracts it is not always easy to imitate the steady controlled secretion of the normal gland. Where the injected or ingested extract is stored in the body and used as required, as happens in thyroid therapy, no difficulty is experienced. But more often the available extracts have only transient effects, and when in addition the preparation must be given hypodermically serious obstacles may arise; for a point is reached at which the patient will revolt against a life punctuated by too frequent pin-pricks and will prefer his deficiency as the lesser evil.

The treatment of diabetes mellitus with insulin is a case in point. The average diabetic needs two daily injections of insulin and a considerable number require three; but few patients would tolerate more. Since the action of insulin is limited to a few hours the humane physician is usually forced to give larger doses of insulin than the immediate level of the blood-sugar would indicate. His patient accordingly oscillates between glycosuria with its attendant threat of ketosis, and the less dangerous but decidedly unpleasant state of hypoglycaemia. More than one attempt has been made in the past to avoid this difficulty by delaying the absorption of injected insulin. Some years ago LEYTON¹ tried powdered insulin suspended in castor oil and showed that the latter hindered the absorption of insulin and smoothed out the grosser oscillations of the blood-sugar. But the oily vehicle is only very slowly dispersed (by phagocytosis) and the risk

¹ Leyton, O.: THE LANCET, 1929, i., 361 and 756.

of local infection is increased. Recently Prof. HAGEDORN and his associates in Copenhagen have attempted to solve the problem by combining insulin with various organic bases to form compounds which are relatively insoluble at the pH of tissue fluids and are accordingly more slowly absorbed. HAGEDORN has just published some of his preliminary results² and ROOT and others³ have reported their experiences with samples of the same preparation, supplied by Prof. HAGEDORN. The preparation in question, protamine insulinate, is made by mixing a solution of insulin hydrochloride with a protamine extracted from the sperm of a species of trout, *Salmo irideus*. The insulin combines with the protamine base to form a compound which is least soluble at pH 7.3, that is, about the reaction of normal plasma. When this mixture is injected into a normal subject evidence of considerable delay in absorption is observed. Compared with ordinary insulin the fall in blood-sugar is much more gradual, and although the degree of hypoglycæmia obtained is rather less, the effect persists for about twice the usual time. Exactly similar differences are observed in diabetic subjects. Here the effect is greatest in those patients who are rather sensitive to insulin and whose blood-sugar under orthodox treatment displays big oscillations. Protamine insulinate smooths out the peaks and depressions to a remarkable extent, and the excretion of sugar and also of ammonia (an index of acidosis) is greatly reduced.

The charts shown by both the Danish and the American workers leave no doubt in the mind of the reader that combination with protamine greatly delays the action of insulin. This is an important advance, but we cannot yet assess its practical significance. A number of incidental problems must first be studied. For instance, the blood-sugar of the diabetic usually reaches its highest level in the period preceding the first meal of the day. The morning dose of insulin has therefore not only to reduce this level, but also to balance the carbohydrate eaten at breakfast. It has been found that protamine insulinate is not absorbed quickly enough to serve this double purpose, and it has been found advisable to use ordinary insulin for the morning dose, reserving the protamine compound for the evening, where a prolonged rather than an intense effect is desirable. That, of course, means that the patient would have to carry two kinds of insulin, and his daily routine is already complicated enough. Moreover the present preparation does not remain stable indefinitely and the suspension must be shaken before the syringe is filled. Finally, the new compound seems to be contra-indicated in diabetic coma where rapidity of absorption is vital. None of these difficulties is necessarily insuperable and the further researches of Prof. HAGEDORN and his colleagues will be awaited with keen interest. Meanwhile it is necessary to point out that the work is still in the experimental stage.

PROSTATIC INVOLUTION

HOWEVER much we may pride ourselves on the advances made in prostatic surgery during the last ten years prostatectomy remains a formidable operation, and it is worthy of note that medical men who have recommended the operation to their patients sometimes show a disinclination to undergo it themselves when they begin to find micturition difficult. Any treatment that holds out a hope of saving an elderly man from the dangers and discomforts of a major surgical operation deserves consideration. Dr. PAUL NIEHANS, in an article which appears on p. 307 of this issue, claims to have given relief to nearly 400 sufferers from prostatic enlargement by the simple operation known as Steinach's ligature II. In his opinion senile changes in the prostate are due to the removal of the inhibiting action of the hormone secreted by the seminiferous tubules and the unrestrained action on the prostatic tissues of the secretions of the interstitial cells of Leydig and of the basophil cells of the anterior pituitary, together with the female hormone which is known to exist in men as well as in women. This endocrine view of prostatic enlargement was anticipated many years ago by Mr. KENNETH WALKER in a Hunterian lecture which was published in our columns.¹ Mr. WALKER then stated that, although it was not known what determines the onset of prostatic enlargement, the enlargement was undoubtedly an incident in the involution of the genital tract. In all probability, he added, it was brought about by an upset in the endocrine balance occurring at the time of the male climacteric. Since that time great advances have been made in our knowledge of the hormones regulating sexual activity and of their interaction with the secretions of the pituitary body; and it is now established that the pituitary plays a very important part in the changes occurring in the endocrine system at the time of genital involution. Dr. NIEHANS summarises recent work on this subject, and whatever may be the value of the method of treatment he advocates we may well admit that senile changes in the prostate will ultimately be explained in terms of endocrinology.

After reviewing former attempts to deal with enlargement by such means as castration and vasoligature, Dr. NIEHANS relates how in 1928 he made use of the method of ligaturing the efferent ducts of the testis that had previously been employed by STEINACH as a means of "rejuvenation." He postulates that by occluding these ducts the hormones of the germinal epithelium are forced through the pores of the tunica albuginea into the numerous veins surrounding the testicle, and thence pass into the general circulation. Since these hormones inhibit the action of the various secretions responsible for senile changes in the prostate, any increase of them in the blood stream would have a curative effect. On p. 242 of our last issue is recorded the demonstration for the first time in

² Hagedorn, H. C., Jensen, B. N., and Krarup, N. B.: Jour. Amer. Med. Assoc., Jan. 18th, 1936, p. 177.

³ Root, H. F., White, P., and Marble, A.: Ibid., p. 180.

¹ THE LANCET, 1924, i., 16.

monkeys that male hormone can cause the disappearance of prostatic hypertrophy induced by oestrone. This would well account for the results following the ligature, when not only symptoms improved, but the size of the prostate diminished, and in the majority of cases residual urine disappeared. But what Dr. NIEHANS does not explain is why ligature of the efferent tubules should prove so much more effective than ligature of the vas. By either method the same result should be obtained—namely, cutting off the external secretion of the testis and increased absorption into the general blood stream. Yet vaso-ligature as a method of treating prostatic enlargement has proved a complete failure. Nor does he make it clear how ligature can revive the activity of the epithelium of the tubules. If the changes in the prostate are the result of involution in the seminiferous tubules, can it be supposed that occlusion of the efferent ducts stimulates their activity in addition to promoting absorption of their secretion?

Medicine however is not an exact science and the proof of the validity of Dr. NIEHANS'S observations should be sought in results rather than in deductions. Does ligature of the efferent ducts in fact relieve the patient of his symptoms, lead to a shrinkage of the prostate and the disappearance of the residual urine? In assessing the value of any method of treating prostatic obstruction it must be borne in mind that the symptoms of which the sufferer complains are liable to fluctuate. Periods of increased frequency and difficulty are followed by intervals of improvement, and care must be taken not to mistake one of these quiescent periods for an improvement that is the direct result of treatment. Moreover it is now certain that much of the difficulty in micturition experienced by a prostatic patient is the result of a dynamic rather than a static factor, that is to say, spasm of the sphincter rather than mechanical obstruction. Those who believe that Steinach's ligature II. acts through the sympathetic system, rather than by means of an alteration in the endocrine balance, may be right. But however disinclined urologists may be to believe that so simple a proceeding as that advocated by Dr. NIEHANS can cure prostatic obstruction, the mere fact that it is simple and can do no harm demands that it should be tried. If one man has been able to obtain such excellent results, others should have no difficulty in confirming them. The value of Steinach's ligature II. can readily be proved or disproved.

EPIDEMICS OF MALARIA

IN a paper read before the Royal Society of Tropical Medicine and Hygiene on Jan. 16th and expressly confined to the epidemiological side of malaria, Lieut.-Colonel C. A. GILL dealt primarily with the epidemic which began in Ceylon in the autumn of 1934. In any particular part of the area which this finally covered it broke out with such startling suddenness that its onset could be fixed to a day, the date being a month later in the southern than the northern

part. Thus in the town of Kurunegala, selected for intensive study for its convenient situation, the dispensary attendances were respectively 106 and 306 on Oct. 28th and 29th. This first wave had four morbidity but only three mortality peaks, set at about monthly intervals, the first morbidity peak bringing no corresponding rise in the death-rate. Further, as to children under 4, whose susceptibility to malaria is well known, there was an actual lowering of the percentage attending dispensary during the first wave and this was followed by no increase in deaths. These facts led GILL to the conclusion that the first morbidity peak was caused by relapses among older persons—a view strengthened by the reasoning that, had it been due to fresh infections, there must first have been a great increase in the numbers of infective *Anopheles culicifacies*, that such increase in infective numbers must have taken place from a human population still in its normal state of health, and that when infective the mosquitoes must have abstained from children's blood. There is no mention of any influx of persons not immune to the local plasmodial strains, so that GILL was left with a combination of two factors as the cause of the epidemic, the first being some influence on the plasmodium or its host making for relapse, the second the appearance of conditions favourable to multiplication of the mosquito carrier. As to the latter, he notes that there was a sharp rise in atmospheric humidity in October, 23 days before the onset of the first four-peaked epidemic wave, and another in April which in turn was followed by another epidemic wave. He also points out that during the nineteenth century malaria epidemics took place simultaneously in different parts of the world, that they were related to the cycle of sunspots, and that these last produce widespread abnormality of meteorological conditions. He showed a curve based on the seven and a half sunspot cycles which fell between 1860 and 1934, the most striking feature of which was the association of malaria pandemics with maximum or minimum sunspot numbers. These conditions of the sun are apt to be associated with drought or floods, and GILL pointed out that drought in a normally wet zone and flooding in a normally dry zone are likely to bring about conditions favourable to excessive breeding of mosquitoes. It was not however noted at the meeting that there may well be a nearer relationship between a changing quality of light and the occurrence of malaria relapse; EUGENE R. WHITMORE¹ has, for instance, shown that violet light produces relapse in the malaria of canaries, an infection which is due to another plasmodium, *P. relictum*. Colonel GILL was insistent on our powerlessness with our present knowledge, despite its great advance during the last fifty years, to prevent malaria epidemics, or to control them when they have begun. The need for further investigation was emphasised by his statement that the deaths in this outbreak were about 100,000, that the State relief measures

¹ Amer. Jour. Trop. Med., 1922, ii., 475.

cost £350,000, and that probably over a third of the island's inhabitants were infected, with consequent money loss, ill-health, and misery.

In discussion Sir RICKARD CHRISTOPHERS mentioned the likeness of the Ceylon epidemic to those in the Punjab in 1892 and 1908, the former the greatest ever recorded with 150,000 deaths, the latter covering an area greater than the whole of Ceylon. He described the maps of malaria epidemics as giving the instinctive feeling of "malaria cyclones"; a resemblance not merely superficial since their fundamental cause is meteorological, but still not the whole matter since happenings in previous years had their cumulative results. It was startling, he felt, to picture the sudden outburst of these epidemics as due to relapses, but Colonel GILL's contention needed serious consideration. The next speaker, Colonel S. P. JAMES laid particular stress on a possible widespread invasion of the area by infective anopheles, and said he thought that a relapse wave would imply a primary wave about eight months earlier. He urged the need for further research; especially since there is still no moderately complete account of the life-history of *A. culicifacies* in its adult stage, though it has been known for over thirty years as an important agent in the spread of malaria. Sir MALCOLM WATSON went outside the deliberately limited scope of the paper by dealing with endemic, not epidemic, malaria, and urged the primary importance of the house site in prevention. It was first necessary, he said, to select the proper site for a village and then to go forward with all that was necessary for good sanitation on that site. He insisted that to make the most of funds, first things must be put first, and held that this great epidemic showed that malaria was the major disease problem in Ceylon. Certainly this looks reasonable; nevertheless those who remember an effect of the great influenza pandemic of 1918 will hesitate to accept Sir MALCOLM's diagnosis without question; for at that time, among 14,640 persons who had been treated for hookworm infection² the death-rate per mille was 7.5, whereas among 3253 on the same estate who had been left untreated it was almost double, 13.8. An underlying cause of ill-health may be of greater importance than an evident cause of deaths. The further investigation which this speaker also urged is necessary before there are data for any firm conclusions; and in the meantime we suggest that the result of no constant drain on bodily reserves can safely be disregarded.

Prof. D. B. BLACKLOCK, in referring to the possibility of an epidemic of relapses, mentioned the work reported from Liverpool in the post-war years, which showed that treatment from July to December had a relapse rate of 38 per cent., while a similar treatment in January had one of 94 per cent. He dissented from the view that modern medical science was powerless to prevent and control these epidemics, and held that if the £350,000 spent on relief had been available for prevention the course of events would

have been very different. He spoke, then, essentially of endemic malaria, but he further pointed out the difficulty of dealing from that point of view with a free rural population in the tropics. Sir WELDON DALRYMPLE-CHAMPNEYS felt that, as put forward to the Royal Society of Medicine by Dr. R. BRIERCLIFFE and himself,³ the three most important factors in the causation of this epidemic were the encouragement of breeding of *A. culicifacies* in river pools left by the drying rivers, the fact that the population in the wet zone of Ceylon was little "salted" to malaria, and the semi-starvation of the people owing to partial failure of the paddy crop. He, too, urged the need for concentration on research, and was sure that remarks by Colonel GILL which had been taken as pessimistic were merely meant as pointers to lack of knowledge and stimulants to fill its gaps. Certainly all who commented on his paper were at one with the opener about the need for more intensive study of the problem of epidemic malaria. Colonel GILL has introduced a new and promising line of thought which is certain to be put to the test as soon as opportunity offers. His valuable paper and the informative discussion will be available in full in the coming issue of the Society's *Transactions* (vol. xxix., No. 5).

STANDARD BLOOD COUNTING APPARATUS

WE printed last week a request to hæmatologists from the British Standards Institution for criticism of a specification drawn up for counting chambers and dilution pipettes. This institution, which has done good work in standardising many technical processes used in commerce and engineering, has now turned its attention to the technique of the medical laboratory and has drafted a specification for a standard hæmocytometer. This contains no novelties with the exception that the ruling of the counting chamber embodies features of both the Neubauer and Glaubermann rulings, with one or both of which most workers are familiar. It is manifestly a good thing for laboratory methods to be standardised, so far as this is possible. Few people other than those actually engaged in laboratory work realise the wide divergence in results which may be obtained from the same specimen by the use of different techniques of examination; standardisation of method is the first step towards a valid comparison of results obtained in different laboratories. In selecting the hæmocytometer to start on the British Standards Institution has taken a relatively simple test object; even for this however the specification occupies ten foolscap sheets of typewriting and five sheets of line drawings. The specification is still only in draft form and the institution is anxious that before it is completed it should receive the consideration of all interested parties. Copies of the draft may be obtained on application to the director, British Standards Institution, 28, Victoria-street, London, S.W. 1.

² Rockefeller Foundation, Internat. Health Board, Fifth Ann. Rep., 1919, p. 61.

³ See THE LANCET, 1935, II., 1176.

ANNOTATIONS

ŒSTRIN AND CANCER

No branch of biological science shows such rapid progress as the study of sex hormones, and unlike advances in our knowledge of other series of pharmacologically active substances, this progress has covered all the aspects of the subject—physiological, pathological, and chemical. There is little doubt that the original stimulus for the work now developing so successfully was the observations of Allen and Doisy, some twelve years ago, which put research on the ovarian hormone on a sound experimental basis. A second great stimulus came through Aschheim and Zondek's recognition of œstrus-producing hormone and prolan in the urine. A year or so later, crystallisation of the former led to the foundation of the accurate chemical investigations in which so many have taken an active and important part.

Some of the most surprising results of this work concern the chemical relationships of the œstrus-producing hormones. Their recognition as derivatives of the sterol series has linked them up with vitamin D on the one hand and such substances as the cardiac aglucones on the other, and it is only natural that this chemical relationship should lead to speculation about the possibility of sex hormones having other actions besides the main one. It has been shown, for example, that many of the male hormone derivatives are œstrogenic, and Zondek's discovery of the œstrus-promoting factor in the urine of stallions indicates the complexity of the physiological activity of these bodies. The further observation that certain carcinogenic substances are also œstrogenic raises the question whether there is some relation between œstrin and malignant disease—a question of more than academic importance now that œstrin in substantial doses is widely used in medical practice. It has been claimed by a number of workers, particularly by Lacassagne, that it is possible to increase the incidence of mammary carcinoma by administration of œstrin, and it has also been pointed out that administration of very large quantities of œstrin will bring about changes in the epithelium of the genital tract of a type which suggest malignant proliferation, although no epitheliomata have been reported. Fortunately, however, we have the clear-cut demonstration, by E. L. Kennaway and his co-workers,¹ that œstrin, when painted on the skin of mice according to the standard technique employed by the Cancer Hospital workers in testing for carcinogenic properties, was entirely without effect. From this it appears that œstrin is not carcinogenic in the same way as 1:2:5:6-dibenzanthracene or methylcholanthrene are carcinogenic. It must be remembered also that the animals in which Lacassagne produced carcinoma of the breast were of inbred stock, selected for susceptibility to cancer, and that the conditions were therefore very different from those of administration of œstrin to human beings. Moreover, as Dr. Cramer and Dr. Horning pointed out in our last issue, all these experiments, including their own, involve the treatment of animals with large quantities of œstrin over a very long period, and here again the conditions do not resemble those of clinical practice.

In reviewing the relationship of sex hormones, carcinogenic hydrocarbons, and synthetic œstrogenic agents, Prof. E. C. Dodds² has lately remarked that

the similarity, in chemical structure, between carcinogenic hydrocarbons and œstrin is by no means so close as the similarity between the male and female sex hormones; yet there has never been any suggestion that the treatment of women with large doses of œstrin is likely to lead to masculinisation effects.

GONOCOCCAL EPIDIDYMITIS

THE frequency of infections of the epididymis secondary to gonorrhœa reflects unfavourably on the application of present methods of treating this disease. Various authorities place the incidence of this complication at from 2 to 25 per cent. of all cases of gonorrhœal urethritis, and the average is probably in the neighbourhood of 10 per cent. In fact, though nearly always preventable, it is by far the commonest of all intrascrotal infections. The way in which it is transferred nevertheless remains in dispute. There is little evidence to suggest a blood-stream infection; but the theories of spread through lymphatics or by surface continuity along the mucous membrane of the vas deferens have their advocates, while Pelouze¹ believes that infected material is forced down the lumen of the vas deferens into the epididymal tube—a belief widely shared in the United States. The aetiology of the condition, at any rate, is not in doubt. Trauma to the posterior urethra, in the presence of infection, is the almost invariable cause, and may result either from the patient's indiscretion or the doctor's mismanagement. Unfortunately it seems that the latter is often to blame. The posterior urethra may be damaged by the use of excessive pressure in urethral irrigations, by too frequent irrigation, or by fluid which is too hot or too strongly antiseptic, and a similar result may be produced by prostatic massage or urethral instrumentation carried out too vigorously or too early. On the other hand, the patient may cause or contribute to his own misfortune by sexual and alcoholic indulgence or by vigorous exercise, especially when the bladder is full.

Robertson and Lee² have recently described their methods in the treatment of 65 patients with epididymitis, in 90 per cent. of which the infection was known to be gonococcal. They emphasise the importance of avoiding this complication by care in treatment, and once it is established they advocate conservative methods, which proved successful in 63 of their 65 patients. The difficulty of achieving complete immobilisation of the scrotum by the ordinary methods of support, by suspensory bandage or jock-strap, is overcome by the use of an ingenious but simple application of strapping, which is a modification of that used in the Bellevue Hospital, New York City. The scrotum is brought forward to the suprapubic region and there immobilised, while at the same time the scrotal skin is protected from the irritating effects of the strapping by a layer of gauze, and in this way local applications of heat or cold are rendered unnecessary for the patient's comfort and there is no need of operation or admission to hospital. At the same time rest in bed for the first three days is advised. The indication for operation is the persistence of fever and acute pain at the end of this period, and the operation of choice is epididymotomy, which was performed in 2 cases.

The treatment of gonococcal epididymitis by

¹ Pelouze, P. S.: *Surg. Clin. North America*, 1935, xv., 213.

² Robertson, J. P., and Lee, A. B.: *Amer. Jour. Surg.*, 1935, xxx., 462.

¹ *Proc. Roy. Soc., B.*, 1935, cxvii., 318.
² *Ergeb. d. Physiol. u. exp. Pharm.*, 1935, xxxvii., 264.

surgical incision and drainage has never found favour in this country, and the present support for conservative measures is therefore welcome. In the rare cases where surgical intervention has seemed advisable excellent results have been obtained by simple needling of the globus minor, accompanied where possible by aspiration of pus or inflammatory secretion.

INCENTIVES IN INDUSTRY

EXPERIMENTS recently carried out by C. E. Mace¹ were directed towards determining the efficacy of setting up standards of achievement as an encouragement in the performance of tasks or the learning of them. Measurement of results was necessarily adopted as a criterion of comparison between different standards, and conclusions emerged that should find application in industrial life. The investigation falls into place with other work, such as the study of the actual movements involved in a specific industrial activity, which is aimed at the attainment of optimum results consistent with the comfort and well-being of the worker, without which proviso there is more than a danger that opposition will be aroused against what is regarded as a process of "speeding up." The experimenter in this case is interested in the human side rather than the mechanical, and expresses his appreciation of the larger problems when he hopes that the incentives of industry may ultimately be assimilated more closely to those of professional life.

Industry has changed greatly since the bad old days when a worker was paid as little as possible and driven as hard as his physical powers allowed, his need for the necessities of life being regarded as sufficient incentive to work. That need will always be a primary urge to human endeavour, but man, for good or ill, is driven by so many other motives that industry is compelled to take account of them. It is a commonplace to lament the decay of handicraft with its gratification of the pride of achievement, which Mr. Mace calls upon in his experimental subjects; and to regret the repetitive processes that accompany mass production and appear to condemn workers to a day of monotony and boredom. Yet it is a discovery of industrial psychology that repetitive work need not be subjectively monotonous or inevitably accompanied by boredom; human nature is so adjustable that with reasonable conditions of work, including rest pauses, such tasks can be happily performed. Rest pauses were introduced, on obvious physiological grounds, to avoid fatigue, and increased output justified them. But some paradoxical results obtained by Elton Mayo suggest² that unexpected factors such as a sense of social solidarity in regard to one's fellows and the management of the firm, rather than diminished physiological fatigue, were the cause of the improved output in a batch of workers who were closely observed over an experimental period of two years. This observation indicates a trend of thought that is coming more and more to influence industrialists, who have passed beyond the stage when Factory Acts were necessary to ensure attention to material safeguards of the health of the worker, to sanitation, ventilation, protection against accidents, hours of juvenile labour and, in some cases, rates of pay; their chief function to-day is to protect standards from violation, not to establish them.

The human and social aspects of industrial organisation are now receiving attention, one sign of this development being the employment of industrial welfare workers in factories and similar establishments. In the beginning welfare workers were expected to supervise matters affecting the comfort and material well-being of employees—canteens, amusements, and the like; this they still do, but gradually there is emerging the principle that they serve as interpreters between the ideas of the administrative and employing side and the aspirations or even the dissatisfactions of the workers. An essential in the running of an industrial establishment is attention not only to the material but the emotional welfare of the employees, and in this way the difficulty of adjusting the human element to the demands of modern industry may perhaps be overcome. Welfare workers are now sufficiently numerous to have their own organisation and journal, and they are accumulating knowledge as to the mental attitudes and emotional reactions of individual employees which will fit in with the work of the Industrial Health Board and lead us nearer to the ideal of making the worker happy in his work; for this is, after all, the first condition for the successful working of any system of incentives.

BROMIDE INTOXICATION

OF late years several American observers have thought it well to call attention to the prevalence of bromide intoxication among psychotic, neurotic, and epileptic patients. To such patients bromide is often given for its sedative or anti-convulsive action, and mental symptoms due to too much bromide may pass unrecognised through being attributed to the disease that already exists. This is emphasised in a paper by Preu, Romano, and Brown¹ who describe what they term the symptomatic psychoses of bromide intoxication, and illustrate their description by details of nine cases. General retardation of mental processes, with anorexia and constipation, are well recognised as symptoms of bromism; but further intoxication may, according to these writers, give rise to insomnia, restlessness, disorientation, and loss of memory, followed by ataxia, tremor, and delirium. Refusal of food as well as food is common, and still further aggravates the condition, which indeed is most likely to occur in patients who are cachectic, short of fluid and chlorides, or suffering from renal impairment. Sudden onset of insomnia or delirium in a patient taking bromides should always suggest bromism, and the absence of skin lesions in no way negatives this suggestion. Diagnosis can be made with certainty only by an estimation of the bromide content of the blood. If this exceeds 250 mg. per 100 c.c.m., the mental symptoms can with confidence be attributed to bromide intoxication. Once the diagnosis is established the rest is easy. Bromide administration is stopped; fluids are administered in large quantities, together with 2 to 3 drachms of common salt a day; and under this treatment the symptoms rapidly disappear.

What dosage of bromide is likely to cause this condition? Unfortunately the evidence on this point is inadequate. In two of the cases the quantity taken was unknown; in the other seven it varied from 60 to 115 grains a day, generally for no very long period, but the doses may have been larger. General clinical experience would, indeed, lead us to suppose that they must have been larger, because

¹ Incentives: Some Experimental Studies. Industrial Health Board Report No. 72. H.M. Stationery Office.
² The Human Problems of an Industrial Civilisation. New York: The Macmillan Company. 1933.

¹ New Eng. Jour. Med., Jan. 9th, 1936, p. 56.

very large numbers of epileptics in time past have taken much more heroic doses for prolonged periods without these ill-effects. It may be, however, as Preu and his colleagues suggest, that debilitated patients who for any reason are short of fluid, or whose blood is deficient in chlorides, will react in this unfavourable way to smaller doses. In any case the condition is one which the practising physician should keep in mind.

VASOMOTOR RESPONSES

In the current number of *Brain* Dr. E. Carmichael and his collaborators report the results of some recent investigations. Their intention was to test the functional capacity of the sympathetic nervous system in normal individuals and in patients suffering from various nerve lesions, particularly cases of hemiplegia. They sought first to ascertain whether there was any difference between the vasomotor response in the normal and paralysed limb.¹ Simultaneous temperature readings were taken from the cheeks and tips of the digits of the hands and feet by means of thermocouples, rectal temperature being also registered by this method. Changes in the temperature of the body were stimulated by the immersion of one or more limbs first in hot and later in cold water. The main outcome of these studies was the demonstration that if one or other foot is immersed in hot water the first change observed is a rise of rectal temperature, quickly followed by a rise in the temperature of both right and left hands, the curve of rise being identical for both upper extremities. On transferring the heated limb to a cold bath the temperature of the other extremities falls at once without any appreciable latent interval. The responses obtained in cases of hemiplegia are exactly the same as those obtained in a normal subject. In a further investigation² a more delicate method of estimating the vasomotor reaction was employed. A plethysmograph was applied to a finger or toe in such a way that a slight alteration in the volume of the enclosed digit could be recorded photographically by means of a tambour to which was attached a mirror reflecting a beam of light on to a moving strip of bromide paper. Slight changes in the volume of the digits could thus be continuously recorded. By this method the results previously obtained were amply confirmed and additional observations were made on the effect produced by various extrinsic and intrinsic stimuli. It was found, for example, that the sudden application of pain or cold to any part of the skin, or the occurrence of a sudden noise, produces an almost immediate fall in the volume of the digits in all limbs. This effect is also produced by voluntary deep breathing, by mental activity, and by visceral pain. It was shown that this effect still occurs when the normal blood-supply of the limb is entirely cut off by a tourniquet. In subjects from whom the sympathetic control to one limb has been either removed by operation or destroyed by injury this vasoconstrictor action fails to occur in the affected limb. Further, the stimulus is only effective if applied to a part of the body from which normal sensory nerve conduction is intact. When a painful stimulus is repeated the initial vasoconstrictor effect gradually passes off, even though the last stimuli are as painful as the first. The 23 patients suffering from lesions of the cerebral

hemispheres examined all showed responses exactly similar to those obtained with the normal subject. As the lesions in these patients involved between them all parts of the cerebral hemisphere the authors conclude that lesions of the cerebral hemisphere have no effect on the sympathetic vasomotor control of the extremities. They believe, however, that this control is dependent on the integrity of both pre- and post-ganglionic sympathetic fibres and on the integrity of the main sensory pathway from the point at which the body is stimulated. The sympathetic vasoconstrictor responses which occurred so constantly in these experiments were apparent in less than 4 seconds after the stimulus was applied. On the other hand, the vasodilator effects produced on warming the body only developed after the rectal temperature had begun to rise.

OWING to the death of King George the annual dinners of the Hunterian Society and of the Medical Society of London will not take place this year.

Mr. C. H. Fagge will deliver the Hunterian oration of the Royal College of Surgeons of England at 4 P.M. on Friday, Feb. 14th, his title being John Hunter to John Hilton.

OWING to inadequate response from candidates, optional translations from Latin and Greek will no longer be set in the membership examination of the Royal College of Physicians of London. More importance will be attached to the translations from French and German, and there will be a definite small allotment of marks for these in the total qualifying marks. They will however remain optional.

THE death occurred at St. Andrew's on Sunday, Feb. 2nd, of Mr. FARQUHAR MACRAE, consulting surgeon to the Western Infirmary, Glasgow, and the first secretary-inspector of the Indian Medical Council.

WE regret to announce the death of Mr. WILLIAM H. BATTLE, consulting surgeon to St. Thomas's Hospital, which occurred on Feb. 2nd, at Woking, Surrey. Mr. Battle earned high esteem from the medical profession both as general surgeon and as specialist in more than one important department, while to this journal he rendered valuable service as a collaborator for over twenty years.

INDEX TO "THE LANCET," VOL. II., 1935

THE Index and Title-page to Vol. II., 1935, which was completed with the issue of Dec. 28th, is now ready. A copy will be sent gratis to subscribers on receipt of a post card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

PORT REGIS PREPARATORY SCHOOL.—At this preparatory school two scholarships of £100 each are annually awarded to the sons of medical men. The school is at Broadstairs, Kent, and the scholarships were recently founded by Sir Milsom Rees. The next examination will be held on March 3rd, 1936. Candidates must be under 9 years of age at the time of competing, and the scholarships are normally tenable till the holder leaves the school. The holders will be selected at an interview in London from among those boys who have done best in some simple examination conducted in or near their houses. Applications for the scholarships must be addressed to the headmaster, Port Regis School, Broadstairs, from whom full particulars may be obtained. The applications must be made not later than Feb. 20th.

¹ Uprun, V., Gaylor, J. B., Williams, D. J., and Carmichael, E. A.: *Brain*, 1935, lviii., 448.

² Sturup, G., Bolton, B., Williams, and Carmichael: *Ibid.*, p. 456.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXXXVII.—PROGNOSIS IN HEMIPLEGIA IN MIDDLE LIFE

HEMIPLEGIA occurs so often as a sudden event in the life of a person who has appeared to be in normal health and is actively engaged in his occupation that the question of prognosis is likely to arise immediately, a forecast being demanded both as to life and to return to activities. In general the prognosis as to life depends on the nature of the cerebral lesion and the vascular condition, while the return of function in recoverable cases depends upon a variety of other factors, not the least being the method of treatment adopted.

Causation

The great majority of hemiplegias result from vascular lesions — hæmorrhage, embolism, or thrombosis.

In my opinion a hæmorrhage sufficient to cause hemiplegia is nearly always fatal at the time or soon after. On the other hand a majority (probably from 60 to 75 per cent.) of victims of hemiplegia occurring between the ages of 40 and 65 from thrombosis or embolism survive the event. Estimation of the immediate prognosis depends, therefore, to some extent on detection of evidence of cerebral hæmorrhage, and a guarded one must be given unless this point has been settled. It cannot always be easily settled, nor is it of great immediate importance. If lumbar puncture has been performed, a hæmorrhagic fluid points strongly to cerebral hæmorrhage and to a fatal issue.

If a patient has retained or has fully recovered consciousness the questions which arise are the extent to which he will regain his normal health, and the likelihood of a recurrence of a vascular cerebral lesion. These questions depend upon the state of the vascular system, and will only be briefly summarised here. Hemiplegia from *embolism* is usually an accompaniment of mitral stenosis, and often occurs in patients whose myocardial function is adequate and who are capable of fairly normal activity for many years. In them the liability to recurrence must be considered. It is probable that a second stroke occurs only in a minority; at any rate there may be an interval of many years before it does so, and there are no means of foreseeing to which individuals it will happen. If a second embolus lodges in the opposite side of the brain to the first one the effects are more serious, since pseudo-bulbar symptoms will be produced in addition to the paralysis of the limbs. In cases such as these it is well worth while endeavouring to secure good recovery of motor functions; when the embolism occurs in association with auricular fibrillation or infective endocarditis the prognosis does not justify any serious effort in this direction.

The commonest cause of residual hemiplegia in middle life is *thrombosis*. Here the prognosis as regards recovery from the stroke varies very greatly, according to the cardiovascular condition. It is not nearly so unfavourable in middle life as in the elderly patients in whom it is often seen. In a certain number, however, even of those below the age of 60, an advanced state of arterio-sclerosis makes the prospect of recovery doubtful; further thrombosis may occur, or hæmorrhage may take place into the softened area. Hypertension which persists, or returns

after the stroke, not only increases the risk to life, but diminishes the amount of active treatment which is justifiable. These patients must be spared effort and inconvenience, both of which are necessary elements in a successful re-education.

There are, however, a large number of patients who make good recovery from thrombosis and live for many years in a satisfactory state of general health. In some of them the degree of vascular degeneration is remarkably slight, so slight that the cause of the thrombosis seems hard to explain. Most favourable of all are those in whom the lesion is a manifestation of vascular syphilis, which may respond well to treatment. The future of these patients depends on the extent to which muscular power and skill can be restored to the limbs, and more particularly to the hand. It is to the prognosis of residual hemiplegias of this type that consideration will mainly be given here.

Effect of Treatment

Some recovery of function in hemiplegia usually takes place spontaneously, but the final result is one of considerable disability, and falls far short of what may be achieved by suitable treatment. The ultimate outlook can therefore only be considered in conjunction with the mode of treatment adopted, and this should be made clear to the patient as soon as he is capable of realising it. The result in a case which is left to nature may be summarised by saying that the face recovers well, the leg fairly, and the arm badly or not all. The difference in improvement between the two limbs is mainly due to the fact that the sound arm can be used alone whereas the leg cannot; if this can be circumvented the improvement in arm and leg will be similar. In a neglected case the disability is often aggravated by contraction of joint-capsules and ligaments as well as by muscular contracture. If these occur they affect the prognosis unfavourably, as they are difficult to deal with satisfactorily.

The patient's conception of prognosis in hemiplegia is apt to be a gloomy one. He will quote the case of a relative or friend who lost the use of one side, who never recovered it, and for whom "the doctor said there was nothing to be done." If his medical attendant has clear ideas on the subject, is aware that the outlook for uncomplicated hemiplegia is potentially good, and can convince the patient of this fact, he may appreciably improve the prospect.

EXPLANATION TO THE PATIENT

In general the prognosis of hemiplegias, even of a favourable type, is not altogether good; many excellent recoveries are seen, but also many patients whose affected arm is of little use to them. The reason is that a considerable number of them do not obtain, or carry out, a suitable form of treatment, and this circumstance should not be allowed to obscure the fact that the prognosis in an uncomplicated case, treated from the outset on rational lines, is much more favourable. The situation may be represented to the patient as follows: *In the leg* it will probably be possible to prevent the formation of any deformity; he may eventually walk almost normally on the level, but will experience a slight

disability in going upstairs or a steep incline; once he has begun to walk the condition will continue to improve. Should spasm of the calf muscles prove more than usually intractable the result will not be quite so good, but can be improved by small orthopaedic measures. *In the arms* there will always be inequality in power, but the affected limb should become capable of use for most ordinary purposes. The grip may be only slightly reduced; extension of the wrist and fingers will be more so. The movement which is most likely to remain defective is supination, and herein lies the chief disability which he will encounter. He may, in fact, be able to lead the life of a middle-aged man in a fairly normal way.

It should be made clear to the patient that this result will not be brought about by drugs or any form of treatment which he undergoes passively, but may be achieved if he will submit himself for some weeks to a régime involving discomfort and tedious effort.

IMPORTANCE OF ACTIVE MOVEMENTS

Having indicated to the patient what he may reasonably hope for, it remains to assist him to bring about his recovery, and the next important factor in prognosis will be found in the extent of his willingness to coöperate. To expect him to make constant effort to use the paretic arm while the sound one is free is to make demands on memory and patience which will seldom be fulfilled. If the sound arm is immobilised by a bandage or splint, continuously at first and intermittently at a later stage, his attempts to use the paretic one will become reinforced by habit, many reflex movements will be performed unconsciously, and the arm will partake of the improvement which takes place as a rule in the leg. The only purely passive forms of treatment which are necessary are full movements of joints to maintain mobility, and to ensure positions of the limbs which will not permit of the formation of deformities.

In the leg, and to a lesser extent in the arm, the prognosis is affected by the duration of confinement to bed. It is much improved if his general condition permits the patient to sit in a chair for part of the day at an early stage, and if, by means of a wheeled frame, he is enabled to perform the movements of walking at a stage when the leg will not bear his full weight. If this treatment is persisted in, and supplemented by suitable exercises, the results are often remarkable, and a bad prognosis should not be given unless it has been tried. All cases do not respond alike, and in a few, although the spasm diminishes, muscular power does not show corresponding improvement.

In the cases considered so far treatment on the lines described has been instituted from the start, before the initial flaccidity has been replaced by spasm. There are, however, many patients in whom this has not been done, because their minds and those of their relatives are set on other measures. A large number obtain faradic stimulation, by which spastic muscles are goaded to further spasm while the re-establishment of nervous paths is not promoted. Many others put their trust in prolonged courses of massage, which is in fact not indicated and diverts attention from measures of real importance. Practitioners will at times be consulted about the outlook in cases of this kind. In them it is always less favourable, but there is hope of improvement in any limb in which the range of passive movement is not restricted. When this range is restricted the question has become an orthopaedic one.

Complicating Factors

Uncomplicated hemiplegia has been considered above; the prognosis is often affected unfavourably by concomitant defects in neurones outside the pyramidal tract. The most important of these are expressed by psychic changes, which may be present in almost any form or degree. If they persist they may render successful treatment impossible. But their duration cannot be foretold; quite often they clear up with surprising rapidity after a few days, and they should not be regarded as contra-indications to the line of treatment referred to. Some of the best results I have seen were obtained in patients who were at first completely non-coöperative. In some of them it may be advisable to put the sound arm in a plaster. It will often be found that irritability in itself provides a stimulus for movement, and it is less to be feared than apathy.

Hemi-anesthesia, usually in the form of a diminution rather than absence of tactile and muscle senses, may accompany a hemiplegia; it impedes recovery to some extent by increasing the awkwardness of the paretic limb. In many cases, however, it undergoes spontaneous improvement, and it does not call for any modification of treatment.

The prognosis in hemiplegia is influenced to a considerable extent, though in different directions, by the side of the body affected. Right hemiplegia in right-handed individuals is more to be feared than left, because it is likely to be accompanied by aphasia, though in thrombosis this does not always happen. But it has been my experience that the prospect of recovery of motor function is decidedly better when the right side is affected. The greatest danger is that the hemiplegic will accept his disability and settle down to the use only of the unaffected arm. It is much more difficult to prevent him from doing so when the sound arm is the one which he uses by choice and by habit. From the purely motor point of view the best recoveries are seen in right hemiplegias, and the most favourable type of case is a right hemiplegia which has escaped aphasia.

NEILL HOBIHOUSE, M.D., F.R.C.P.,

Physician, Royal Free Hospital; Assistant Physician West-End Hospital for Nervous Diseases.

ABERYSTWYTH AND CARDIGANSHIRE GENERAL HOSPITAL.—It is proposed to build an entirely new block to this hospital on the site now occupied by the women's ward. A sum of £25,000 will have to be raised to meet the cost of equipment and the provision of 24 more beds.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—For F.R.C.S. primary candidates a course of lecture-demonstrations in anatomy and physiology will be given on Mondays, Wednesdays, and Fridays at 8 P.M., from Feb. 24th to April 24th, at the Infants Hospital, and an evening clinical and pathological class for M.R.C.P. candidates at the National Temperance Hospital on Tuesdays and Thursdays at 8 P.M. from Feb. 25th to March 12th. The following courses will also be held: gynaecology, at the Chelsea Hospital for Women (Feb. 10th to 22nd); chest diseases, at the Brompton Hospital (Feb. 10th to 15th); thoracic surgery, at the Brompton Hospital (Feb. 24th to 29th); orthopaedics, at the Royal National Orthopaedic Hospital (March 9th to 21st). Week-end courses have been arranged as follows: children's diseases, at the princess Elizabeth of York Hospital (Feb. 22nd and 23rd); chest diseases, at the Brompton Hospital (March 7th and 8th); clinical surgery, at the Royal Albert Dock Hospital (March 14th and 15th). Full details may be had from the secretary of the fellowship, 1, Wimpole-street, London, W.1.

SPECIAL ARTICLES

MEDICINE AND THE LAW

A Conflict of Loyalties

In October last the German legislature passed an Act forbidding marriage between two persons one of whom is (1) suffering from an infectious illness which may seriously injure the health of the other or of the offspring; or (2) under guardianship for being a spendthrift or insane; or (3) is suffering from a disorder of the mind which would make the marriage "undesirable" in the public interests, or from a hereditary disease. The chief diseases which act as a bar to marriage are venereal disease and unhealed tuberculosis. In other infectious diseases it is for the doctor to make up his mind in each individual case whether there is a grave danger to health. In deciding whether a given marriage is undesirable he must treat it on its own merits. Dr. Schläger, in an article on the new Act,¹ points out that the doctor will in each case have to strike a balance between his duty of secrecy to his patient and his duty to disclose information in the interest of the community. The law binds him, when he can stop an undesirable marriage only by breaking his duty of professional secrecy, to put the public interest first. Naturally it is impossible to lay down any hard-and-fast rules which will fit every case. It is for the doctor ultimately to make up his mind just how much he thinks it necessary to disclose. He may go too far and commit a breach of the law which binds him to professional secrecy. In certain circumstances he might be found guilty of negligence.

German medical men thus have now placed upon them an extremely invidious duty. It seems to have no analogue, fortunately, in English law. Any English physician must notify certain infectious diseases and industrial diseases, but the hardship which this statutory breach of professional confidence may cause is not comparable to the injury which may be done to a patient who consults a doctor in good faith and then finds afterwards that the doctor has played the part of what amounts to a police spy in preventing a marriage which, apart from statute, is no concern of the doctor at all. Mr. Justice Avory tried in 1914 to throw upon doctors the duty of disclosing to the police any cases of abortion which they came across in their practice, and the profession has successfully resisted the imposition of such a repugnant duty. The position of the German doctor is the more difficult in that his duty of secrecy is not only a professional but a legal duty in a far stricter sense than in this country. Our colleagues in Germany are not to be envied the problems they will apparently have to face and the decisions they will have to make under this legislative venture.

Married Women and Doctors' Bills

The Law Reform (Married Women and Tortfeasors) Act of 1935, the relevant section of which came into operation last August, has made a radical alteration in the position of married women in respect of contracts and their liability to pay (amongst other things) the doctor's bill. Before that date a married woman was not personally responsible for her contracts. A judgment could only be obtained against her separate estate (*Scott v. Morley*, 20 Q.B.D. 120), and if she had no available separate estate the creditor

was unfortunate, because unless the married woman carried on business either alone or jointly with her husband she was not liable to be made bankrupt. A judgment summons was useless, for although her separate estate was liable, she was not personally liable to pay, and in order to obtain an order on a judgment summons committing a debtor to prison a personal liability to pay has to be proved. As a result of the protection given to married women, doctors, like other purveyors of necessaries, were in the habit of regarding them as contracting as agents for their husbands, and so making the husband and not the wife liable as she pledged her husband's credit and not her own. Whether a married woman contracted personally so as to make her separate estate liable or as agent for her husband was a question of fact. To the question "Whom did you trust, the husband or the wife?" the wise man always answered "the husband." Now he should think twice before giving a reply. If the wife has private means, it might be advantageous to regard her as contracting as principal rather than as agent, since judgments can now be enforced against her as if she were a *feme sole*. In cases where the worldly goods are in the wife's name—not an uncommon position in many households—the practitioner would be well advised to open the account in the ledger in the wife's name, rather than in that of her husband. There still however remains one snag, for if a testator by his will, dated prior to 1936, gives property to a married woman subject to a restraint on anticipation and dies after 1936, but prior to 1946, such property is not available for creditors. The practitioner might therefore be well advised to ascertain the date of his female patients' marriages.

Card Party for Medical Charity

In *Williams v. Trevor*, a case before Mr. Justice Finlay last week, the plaintiff claimed damages for the loss of a sum of £10,000 at a card party held at Sunderland House at the end of 1934 for the benefit of the Ivory Cross National Dental Aid Fund and the Royal Northern Hospital. He said that he had been invited to attend and that the defendant had assured him that the organisation of the party would be perfect and that everybody assisting would be personally known to the defendant or to members of the committee of the hospital. It was the plaintiff's complaint that the games (which included baccarat and *chemin-de-fer*) were unfairly played and that card-sharpers were present. Legally, Mr. Williams could establish no cause of action against Mr. Trevor unless there was some breach of contract or breach of duty. When the plaintiff's witnesses had been called and examined, the judge stopped the case. He found no breach of warranty. The letter of invitation to the card-party did not constitute a contract; it was not a warranty but a mere puff. Indeed, though the learned judge seems not to have gone into this aspect of the case, the law declines to recognise a social invitation as having contractual consequences. For instance, if A invites B to dinner and makes elaborate and expensive preparations for his entertainment, A cannot recover damages when B, having accepted the invitation, fails to appear. Mr. Justice Finlay was not quite sure what kind of duty (apart from contractual liability) the organisers of such a party owed to their guests. They must he thought, take reasonable pains to exclude undesirable persons; but he could not rule that there wa-

¹ Deut. med. Woch., Jan. 24th, 1936, p. 152.

any positive undertaking that no bad characters would find their way in. One of the risks and evils of such parties was the probability that undesirable persons would be present; everyone attending such a party must be aware of that risk. If Mr. Williams was to succeed, he must further prove damage arising out of the alleged breach of duty. But the evidence, said the judge, seemed to establish the contrary; Mr. Williams, early in the evening, suspected that there was cheating, yet he continued deliberately to play.

Mr. Justice Finlay is not a judge to chatter in court about extraneous matters. The more weight, therefore, attaches to his condemnation of this association of gambling with charity. He said he knew from personal experience how hard it was to raise money for charities; but he hoped that, after this case, no reputable charity would ever resort to so questionable a method of raising money. He quite appreciated that the patrons of the charities for whom the party was given knew nothing about it, but "such methods were to be severely discouraged." The jury associated themselves with his lordship's remarks, and there is every reason to believe that public opinion will agree.

Alleged Morphine Poisoning at Nursing-home

The inquest on Miss Ada Baguley, who died on Sept. 11th at a home in Nottingham, ended last week in a verdict that the deceased met her death by a fatal dose of morphine or heroin or both, and that the dose was feloniously administered to her by Ronald Sullivan and Nurse Waddingham who together conducted the home. The death certificate had originally stated that Miss Baguley died of cerebral hæmorrhage; post-mortem examination showed that this was incorrect. Mr. Baguley, father of the deceased, died in 1929, leaving an estate of £1600 to his daughter, subject to a life interest to his wife. Mrs. Baguley, the 87-year-old widow, died in the home last May. Miss Baguley, her daughter, described as a helpless cripple, had made a will bequeathing the whole of her estate to Nurse Waddingham and Mr. Sullivan in consideration of their looking after her and her mother. Nurse Waddingham at first denied having given the deceased morphia or having had any morphia in the house. Later she stated that she gave Miss Baguley morphia under medical instructions. Her evidence was in conflict with that of the practitioner who attended the deceased. Dr. Roche Lynch, recalled by the coroner, had expressed the opinion that a dose from one grain upward of the morphia preparations mentioned during the inquest would be a positive fatal dose. The chlorodyne medicine which Miss Baguley had been taking would not, he said, have given her any marked tolerance of the drug. He considered that a fatal dose of morphia must have been administered within six to twelve hours of death.

SCIENCE AND INDUSTRY

THE Department of Scientific and Industrial Research has many activities, most of which are unconnected with medicine or surgery, but all have a close bearing on human life and progress. Some account of these researches is given in the annual report of the Department for the year 1934-35 (H.M. Stationery Office, Cmd. 5013, 3s.).

The protection of X ray workers from gamma rays, by remoteness and shielding, has been investi-

gated, and the conclusion is reached that it is undesirable for the personnel to remain in the immediate vicinity of patients undergoing treatment with large quantities of radium. The investigators point out the high degree of protection attainable with properly designed radium safes, the necessity for expeditious bench manipulation of radium containers, and the superiority of bulky postal transport boxes with only moderate lead shielding over small containers utilising the maximum lead shielding possible.

The Food Investigation Board has investigated the destruction of bacteria in meat by α , β , and γ rays and with β particles from radon. In both cases disinfection goes on at the same rate within a very long range of temperature. The effect of varying oxygen pressure on the rate of oxidation of hæmoglobin to methæmoglobin, besides being of theoretical interest, is of importance in the practical problem of the bloom of gas-stored meat and fish. An interesting research was made into the retarding effect of iodised paper wrapping on the rotting of certain fruits.

Fundamental standards, however unattractive to the unlearned, form bases for all exact scientific knowledge, and the National Physical Laboratory has redetermined the freezing point of platinum, obtaining a value (1773.3° C.) in agreement with the results recorded at the national laboratories of Germany and the United States, within the limits of accuracy obtainable at present; other freezing points up to that of iridium (about 2450° C.) are being redetermined. Close agreement with the Physikalisch-Technische Reichsanstalt in the definition of the metre in terms of the wave-length of the red radiation of cadmium has been reached, making this fundamental unit independent of all existing standards.

The various trade research associations have been active in the investigation of problems arising directly out of industry, and perusal of the report should convince readers that the Department is doing fine work in coördinating researches which, directly or indirectly, add to the comfort or safety of civilised life. The measurement of noise, for instance, may eventually lead to the suppression of unnecessary noises—a matter of the greatest interest to all who have the care of the sick. The medical practitioner is likely to find in the report hints towards solving the increasingly complex problems of diagnosis, treatment, and régime. The volume is inexpensive and is not heavy reading.

THE TROPICAL HOUSE

AN OBJECT-LESSON AT LIVERPOOL

INSTIGATED by Prof. D. B. Blacklock, the Liverpool School of Tropical Medicine has rented a piece of land adjacent to the city for the purpose of building small replicas of houses used in different parts of the tropics. The aim of the model is to illustrate the actual disease-producing conditions which exist in each type of defective dwelling along with such simple methods of dealing with defects as can readily be put into operation. This enterprise may not be very remarkable in itself. Models of unhygiene at home and abroad can be found in museums and other instructive places. But what is remarkable is the conviction of Prof. Blacklock and his group that something effective can be done about it, for the fatalistic belief still widely rules that people, and especially native races, get the houses they deserve.

It is no new idea that houses in our tropical dependencies breed disease. Sixty-five years ago Surg. Major David Boyes Smith, then sanitary commissioner of Bengal, wrote as follows:—

“The people live in villages which appal the sanitarian. Every revolting abomination conceivable is to be met with in these villages—obstructed ventilation, corrupted ground, polluted atmosphere, putrid organic matters, faecal gases, the revolting water tank, with consequent sickness, debility, degeneration and cachexia of the people,”

and in a Chadwick lecture last year¹ Prof. Blacklock, who cited this appalling word-picture, went on to enumerate the many diseases still directly traceable to defects in housing, indicating categorically those diseases which could be avoided by proper selection of site and of material for construction. In our own rural areas bad housing chiefly connotes such defects as inadequate lighting, dampness, draughtiness, or, what may be worse, lack of ventilation and inadequate air space, and the diseases connected with these defects—rheumatism, bronchial catarrh, and tubercle—though important enough, are relatively few in number. In our urban areas structural defects provide lodgement for vermin, while bad ventilation and overcrowding facilitate the spread of epidemic disease, largely by droplet infection. While all this is serious enough, the problem of domestic hygiene in a temperate climate is simple in comparison with the prevention of the variety of diseases due directly to the type of housing in places where the air is always warm and moist. In the tropics the site of a house selected in ignorance of the dangers from anopheline breeding-places may result in constant malaria with its consequent anaemia, fever, and repeated interruptions of agricultural work. The foundations, floor, and walls of a house composed of dried mud or mud bricks are likely to be the source of relapsing fever and many other infections. The materials of which the roof is composed may conduce to the spread of bubonic plague in endemic areas. These relations of cause and effect were set out three years ago by Prof. Blacklock, entitled “The House and Village in the Tropics” (London, 1932. 3s. 6d.), which contains among much serious argument an entertaining chapter on the skin of the native child who from the hour of its birth upwards is subjected to a perpetual series of injuries and pin-pricks of every kind—an aspect of tropical medicine to which too little attention has so far been paid.

The conviction is growing that in many parts of the hot regions of the world the reform of housing methods would mark a definite advance in the prevention of disease, and the Liverpool enterprise is to be welcomed as an agent in putting these ideas into practical form. Students who come to Liverpool to study tropical hygiene, professional and business men going out to live in the tropics, may see for themselves some of the manifold ways in which danger to the health of the tropical household arises. While no doubt research is needed into the best methods of house construction and into the choice of materials for building, the object-lesson at Liverpool should afford the stimulus to such research and the incentive to apply it.

¹ THE LANCET, 1935, i., 526.

STAFFORDSHIRE GENERAL INFIRMARY.—The general committee of this hospital have decided to begin work on extensions which will include a new ward for private patients, a new general ward, and a children's ward. X ray, massage, and electrical departments are also to be built.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Capt. A. T. Rivers placed on Retd. List.
Surg. Lt.-Comdr. P. B. Jackson to *Drake* for R.N.B.
Surg. Lts. D. Simpson to *Halcyon*, P. K. Fraser to *Aphis*, H. E. B. Curjel to *Carlisle*, and D. Chute to *Curlew*.
The Gilbert Blane Gold Medals for 1935 have been awarded to Surg. Lt.-Comdr. A. A. Pomfret, R.N., and Surg. Lt.-Comdr. W. G. Fitzpatrick.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt. J. D. Lendrum to *Pembroke* for R.M. Infirmary, Chatham.

ARMY MEDICAL SERVICES

Maj.-Gen. J. P. Helliwell, C.B.E., late A.D. Corps, retires on ret. pay.

Maj.-Gen. J. P. Helliwell, C.B.E., late A.D. Corps, relinquishes the appt. of Dir., Army Dental Serv., War Office.

Col. J. V. M. Byrne, late A.D. Corps, appointed Dir., Army Dental Serv., War Office. (See also THE LANCET, Jan. 4th, 1936, p. 42.)

ROYAL ARMY MEDICAL CORPS

R. Hospital, Chelsea.—Maj. J. B. Fotheringham, M.B., R.A.M.C., relinquishes the appt. of Dep. Surg. Maj. E. M. Townsend, M.C., R.A.M.C., to be Dep. Surg.

Temp. Commissions: Capt. A. F. Campbell to be Maj.; R. B. Grey, J. Shields, and P. W. Dill-Russell to be Lts.

ARMY DENTAL CORPS

R. J. Godfrey is granted a temp. commn. in the rank of Lt. (*Vide* also Army Medical Services.)

REGULAR ARMY RESERVE OF OFFICERS

Capt. W. G. Burns resigns his commn. and retains the rank of Capt.

TERRITORIAL ARMY

Capt. P. Dwyer to be Div. Adjt. 50th (Northumbrian) Div., vice Capt. P. F. Palmer, vacated.

Capt. J. J. O'Dwyer to be Divl. Adjt., 55th (W. Lan. Div.), vice Maj. J. H. Bayley, M.C., vacated.

Capt. J. G. Black to be Divl. Adjt., 43rd (Wessex) Div., vice Maj. J. E. Rea, vacated.

Capt. R. V. Powell to be Maj.

J. C. H. Speirs to be Lt.

R. M. H. Anning (late Cadet, Epsom Coll. Contgt., Jun. Div., O.T.C.) to be Lt.

ROYAL AIR FORCE

E. B. Harvey and D. S. MacL. MacArthur are granted short service commissions as Flying Offrs. for three years on the active lists.

D. W. I. Thomas is granted a short service commission as a Flying Offr. for three years on the active list and is seconded for duty at St. George's Hospital, London.

RESERVE OF AIR FORCE OFFICERS

Flying Offr. T. P. Mulcahy relinquishes his commission on appointment to a commission in the Indian Medical Service.

INDIAN MEDICAL SERVICE

Majs. to be Lt.-Cols.: P. Verdon, D. V. O'Malley, O.B.E., and S. A. Phatak.

S. W. Allinson to be Lt. (on prob.).

Lt.-Col. W. D. Keyworth retires.

Indian Medical Department.—Maj. (Sen. Asst. Surg.) R. S. Keelan retires.

ROYAL MANCHESTER CHILDREN'S HOSPITAL.—A year ago this institution launched an appeal for £100,000 for the maintenance of the convalescent home, to add a wing to the nurses' home, and for other necessary extensions. A good start was made and in the first four months after the appeal was issued £10,000 was collected, but the £30,000 figure has not yet been reached.

CORRESPONDENCE

IS COUSIN MARRIAGE DANGEROUS?

To the Editor of THE LANCET

SIR,—There has long been a vague belief that human inbreeding is undesirable, and some unions of blood relations are forbidden by law. Recent research has shown that certain diseases are vastly commoner among the offspring of blood relations than in the general population. In Western Europe, marriages of first cousins rarely amount to more than 1 per cent. of all marriages. The following percentages of first-cousin marriages have been found among the parents of patients with certain diseases:—

	Per cent.
Xeroderma pigmentosum (Siemens's data, after 1906 only)	47
Retinitis pigmentosa (Usher's cases)	27
Juvenile amaurotic idiocy (Sjögren's cases)	15
Ichthyosis congenita (Cockayne's data)	14

These examples might be considerably multiplied. Unfortunately, however, research into rare diseases gives us little idea of the importance of the phenomenon for general health.

The fact that the children of first cousins are some thirty times more likely to develop retinitis pigmentosa than the general population does not tell us whether abnormalities of this type (in genetical language, due to rare autosomal recessive gene substitutions) are sufficiently common to render cousin marriage undesirable. Animal experiments give no clear answer. In some species the inbreeding of members of wild populations leads to the appearance of numerous recessive abnormalities. In others it does not. For this reason the Committee on Human Genetics appointed by the Medical Research Council have obtained the coöperation of hospitals in a large-scale inquiry on this question. All patients in the participating hospitals are being asked whether their parents were related, and if so how. It was thought that any less comprehensive inquiry would be worthless, since the data on animals suggest that not only congenital abnormality but liability to certain infections or degenerative diseases might be due to recessive genes.

The preliminary results are distinctly encouraging. Certain rare conditions seem to be rather commoner among the progeny of related than among those of unrelated parents. Nevertheless, the results will not be statistically significant until at least three times the present number of cards have been completed. It is particularly desirable to obtain more data regarding children; and from country districts, where more inbreeding occurs than in towns. While, therefore, the Committee acknowledge with the utmost gratitude the assistance so far given by hospital staffs, they hope that the same efforts will be continued until really adequate data are available. The coöperation of additional hospitals would also be most welcome.

I am, Sir, yours faithfully,
London, Jan. 31st. J. B. S. HALDANE.

MALARIA EPIDEMIC IN CEYLON

To the Editor of THE LANCET

SIR,—In your account of the discussion at the Royal Society of Medicine on Nov. 16th (THE LANCET, 1935, ii., 1176), which has only recently been brought to my notice, there is room for misunderstanding in the remarks attributed to me. I should be grateful if you would allow me to explain my position. Your report runs: "He (myself) agreed with the use of

atebrin *only in hospitals* (my italics) in Ceylon, but thought that this drug would prove to have many advantages owing to its better and more rapid absorption and action. He was sorry that it had been rather pushed into the background." This statement implies that in an epidemic the use of atebrin should be limited to institutional cases solely. Nothing could, in fact, be further from the truth, for it is widely known to-day that peroral atebrin is a well-tried routine remedy in all conditions. Actually in the paragraph quoted above, I was referring to *atebrin musonate*, the new salt of atebrin which is given by injection, and which, being in a trial stage at the time of the epidemic, was suitable only for hospital cases. In my speech I followed up these remarks on atebrin musonate by saying:—

"I am sorry to note that the exaggerated idea of using atebrin musonate as a panacea in all cases has caused the peroral treatment of atebrin to be relegated into the background. . . . Suitable administration of atebrin has availed to reduce the relapse rate and sequelae. . . . A treatment combining atebrin and plasmoquine, the drugs given according to a strict schedule on certain days of the week, is very promising, but where there is a floating population it is advisable to give atebrin alone."

I think this quotation should make my views reasonably clear.

I am, Sir, yours faithfully,
Elberfeld, Germany, Jan. 31st. W. SCHULEMANN.

CONTROL OF MEASLES

To the Editor of THE LANCET

SIR,—I have no desire to enter into competition with Dr. Copeman when he claims to have been the first person to introduce into this country the modern method of prophylaxis and attenuation of measles by means of convalescent serum. At the same time, it may interest him and others to know that, mainly due to the stimulus of the late Dr. Claude B. Ker, convalescent measles serum was used in the Edinburgh City Hospital between the months of February and September, 1924. I was then senior assistant to Dr. Ker, and was his collaborator in this experimental work of attempting to immunise measles contacts in certain wards of the hospital. Unfortunately the findings were not published, partly owing to the fact that I left the hospital to take up another post, but mainly owing to the death of Dr. Ker a few months later. The figures seemed too few to publish as a paper, but a few notes may be of interest—even if somewhat belated.

During the month of January, 1924, I took some blood from several adult measles patients who happened to be admitted to the hospital. The blood, taken off about ten days after the rash, was allowed to clot and the serum was pipetted off and a small percentage of phenol added. In that month ward 7 became infected by an incubating case—introducing measles to the ward. The child was probably infectious for three or four days before being removed on Jan. 21st, on which day also another child from the same school occupied a bed on the other side of the ward for a few hours and was diagnosed measles and removed. Of the other 23 children in the ward, all but 7 had a history of measles; of these 7, 2—one in the next bed to the first case, and the other roughly opposite and three beds away from the second case—were protected by 3 c.cm. of convalescent measles serum. Neither took measles, whereas 4 of the remaining unprotected 5 took measles on Feb. 2nd, 4th, 4th, and 6th respectively.

From the infectious cases above mentioned, treated in side wards, infection was apparently carried to ward 7A

where a small boy developed measles and was isolated on the appearance of his rash on Feb. 14th. Of the 14 children in the ward, 4 had not had measles; all were protected on Feb. 14th. None took measles definitely, but one child on Feb. 26th had a flick of temperature—no catarrh or Koplik's spots—then remission of temperature, and on March 1st a definitely morbilliform rash and a rise of temperature to over 100° F. for one reading. This seemed to have been a case of abortive or modified measles.

In May, 1924, a boy with whooping-cough was admitted to ward 20 and on the next day (May 24th) was isolated for a measles rash which had come out in the night. The exposure of the contacts was in all about 16 hours. The ward contained 15 children, of whom 8 had not had measles. The 8 children received 3 c.cm. of convalescent measles serum on May 25th, nearly 48 hours from the first exposure. None of these children took measles.

Convalescent measles serum was given in several other wards during the summer of 1924, and attenuation of the disease was noticed in many of those measles contacts injected. In one particular case the prodromal period lasted seven days before the rash appeared, and the incubation period in many instances was as long as the twentieth day and once (apparently) the twenty-fourth day, although this was a very doubtful case. During August, 1924, cases of measles occurred in Victoria Park House, a children's home in Edinburgh, and I was asked by the then medical officer of health, Dr. Robertson, to give the contacts some convalescent measles serum. Ten of the 20 children who were contacts had not, according to the history, had measles, but 10 who gave no history of having had the disease were protected with 5 c.cm. of the convalescent measles serum. None of these children took the disease.

Another experiment which was not, however, so successful was carried out in a certain ward of the Craiglockhart Hospital, a poor-law institution near the City Hospital, where an epidemic of measles had broken out among children mainly under two years of age. The serum was given late in the incubation period. Out of 11 contacts who had not had measles, 8 took the disease and 5 of these died later in the wards of the City Hospital to which they were moved.

It could be deduced from these experiments that, if given early enough, convalescent measles serum was of value, not only in preventing but in attenuating the disease.

I am, Sir, yours faithfully,

JOHN MCGARRITY.

Little Bromwich Hospital, Birmingham, Feb. 3rd.

LONDON HOSPITAL CATGUT

To the Editor of THE LANCET

SIR,—A report of an inquest at Cambridge appeared recently in the lay press in which it was stated that death was due to tetanus, and the house surgeon in giving evidence said that he agreed that the infection was from the catgut. There was also in the report the direct implication that the catgut had been supplied by the London Hospital.

This is incorrect. I have been in communication with the secretary of the hospital at which the death occurred, and he writes: "I am glad to be able to inform you that the suspect catgut was not London Hospital catgut." I might add that since the publication by the Medical Research Council in 1929 of the results of the long investigations carried out at this hospital by Prof. Bulloch, in collaboration with Dr. Lampitt and Mr. Bushill, into the "Preparation of Catgut for Surgical Use," the demands for London Hospital catgut have increased very considerably, and we now supply catgut all over the world.

I am, Sir, yours faithfully,

ARTHUR G. ELLIOTT,

House Governor, London Hospital.

Whitechapel, E., Feb. 3rd.

PREMATURE BURIAL

WE have received the following communication: "The Society for Prevention of Premature Burial, founded in 1896, has for its object the reform of the law relating to the granting of death certificates. Until the beginning of this year the Society existed as an independent body, but it is now affiliated with the Council for the Disposition of the Dead Inc., one of whose basic objects is the revision and the codification of the laws relating to death. The Council now have in hand a Bill for the registration of funeral directors. This affiliation has a twofold purpose, (1) the machinery necessary for the reform is strengthened, and (2) overlapping is eliminated. But the internal policy and expenditure of the Society for Prevention of Premature Burial continues, and while informing the public of this affiliation we would like to take this opportunity of seeking further interest and support. Funds and increased membership are earnestly desired. All inquiries should be addressed to the secretary of the Society, 30, Castelnau-gardens, Barnes, London, S.W. 13."

This letter is signed by Major Reginald Austin (R.A.M.C., ret.), Dr. Jane Hawthorne, Dr. J. Lachlan-Cope, Miss Maud Yandell, and Miss Lettice Macnaghten.

PANEL AND CONTRACT PRACTICE

Defaults in Clerical Work

PERSONAL difficulties, encountered in panel practice, are from time to time illustrated by the reports of inquiries (under the Medical Benefit Regulations) into the efficiency of the service rendered by a particular doctor. A recent case from Lancashire shows that his shortcomings can be admitted with frankness by the practitioner and treated with sympathy by the authorities concerned. Between 1925 and 1934 sums amounting to a total of £123 were withheld by the Minister from the moneys payable to the insurance committee, and a corresponding amount was recovered by the committee from the remuneration of the doctor, for the following breaches of the terms of service: failure to furnish divisional and

regional medical officers with the required information on Forms R.M.2; failure to keep proper medical records; failure to return to the committee on request the medical records of insured persons removed from his list; and issue of prescriptions on the official form of the committee to persons not on his panel list. The doctor received formal warnings from the Minister on four occasions during 1928 and 1929. A year ago the medical service subcommittee reported on the failure to furnish on request the records of removed patients, and the withholding of the sum of £75 was recommended. Meanwhile, no medical records of insured persons had reached the committee from him since Oct. 1st last, though he undertook a year ago to return all outstanding records within a week or so. No acceptances of insured persons had

reached the committee from him since last September. In March last year the clerk to the insurance committee asked for particulars as to prescriptions issued by him in the previous October, November, and December to persons not on his register; reminders were sent, but elicited no information. These complaints offered considerable material for the allegation that his conduct as a panel practitioner had been such as to bring panel practice into disrepute and that he had repeatedly infringed the terms of service.

The doctor frankly admitted his omissions and stated that he had been treated at all times with great consideration by the committee. While allowing himself the extenuation, if such it be, that he had a natural dislike for clerical work and a "mistaken but stubborn notion that the essential business of a medical practitioner is solely the treatment of ill-health," he candidly confessed his faults but claimed that, at the end of 1933, he had fully appreciated the duty of better clerical work and had then made a great effort to bring his record cards up to date. In 1934 he had cause to be seriously anxious about his own health, and he diagnosed early pulmonary tuberculosis. He acquired an open-air shelter and lived the complete sanatorium life in the grounds of

his house, keeping up his visits and attendances on patients but sacrificing everything else to the recovery of his health. He was now able to report a marked improvement in his physical condition. He could claim that he was not a man of vicious habits, and that the clerical side of his private practice had been as badly neglected as the records of his panel work. He stated that he had found paid secretarial help disappointing. At the inquiry he had to admit that 33 cards had still not been returned. The inquiry committee briefly reported that the doctor excused himself in the manner already described but called no evidence of his state of health; he had stated that his sputum was examined by the tuberculosis officer of the county in October, 1934, with negative results. The inquiry committee summed the matter up by saying that, even accepting the doctor's own evidence of his health, it found no sufficient excuse for his continued neglect of his duties. The Minister of Health announces that, after considering the report and taking into account the evidence of the practitioner's personal character and professional standing, he has decided not to remove his name from the medical list of the insurance committee. He makes no order as to the costs of the inquiry.

PUBLIC HEALTH

Mental Hospitals in London

AMONG the many tasks of local government, the care of the mentally affected has become more prominent as it has been exercised with more thoroughness and unity of control. Nowhere better than in London can one see that this duty is a heavy one and that it may be carried out in a spirit of enlightened generosity. A recent report¹ describes many activities in connexion with the 33,000 mental patients for whom the London County Council is responsible. The report deals separately with the mentally disordered, and with the defective patients the majority of whom were until 1930 under the administration of the Metropolitan Asylums Board.

MENTAL DISORDER

For the mentally disordered nearly 700 more beds are being provided, according to plans approved during 1934, and there was also contemplated an additional 360 beds at Ewell. For these and other works an expenditure of £31,000 was authorised; further large sums are being spent on the modernisation and better equipment of individual hospitals. The figures published in this report indicate that voluntary treatment is being more availed of; at the beginning of 1935 the number of voluntary patients in residence was 18.5 per 1000. As the public and those concerned with certification come to realise better that voluntary treatment is permissible and advantageous for many of the certifiably insane, it is probable that the number of direct referrals of voluntary patients will continue to rise and the number of certified patients to fall. The voluntary patients in the mental hospitals cannot in London be considered without regard to the Maudsley Hospital, which during 1934 dealt with nearly 1000 in-patients, all of them by its constitution on a voluntary basis. In its various out-patient departments, including those in North London, 4600 patients were treated. If it were not for the

work of this hospital, including that done in a ward of King's College Hospital which is temporarily used as an annexe to the Maudsley, the number under treatment in mental hospitals would be appreciably greater.

So far as direct admissions to mental hospitals are concerned, the proportion these bear to the total population of their district varies between 5 and 9 per 10,000, the average for all London being 7 per 10,000. It would be unsafe to take such figures as fully representing the frequency of insanity in the average population, even if the necessary corrections were made for readmissions and age-groups; criteria used in determining the need for mental hospital care vary in different countries and in different parts of the same country. In the admirably detailed report for 1934 of the commissioner of mental diseases in the State of Massachusetts, which has a population about equal to that of London, the rate for all admissions is shown as 15 per 10,000 of population, far higher in cities than in rural districts. It would not however be fair to conclude that there is a much higher incidence of mental disorder in Massachusetts than in London. The same difficulty is found if an attempt is made to compare rate of discharge or duration of treatment with figures published elsewhere. Among the factors affecting the length of detention is the adequacy of social care likely to be available for discharged patients. Psychiatric social workers, trained to deal with such problems, have been employed experimentally at selected mental hospitals of the L.C.C. since 1931; the appointment of a social worker at each of the ten mental hospitals has now been authorised, in addition to the five who work at the Maudsley Hospital.

MENTAL DEFICIENCY

It is in regard to mental defect that social treatment is most conspicuous in the report. Systematic supervision of defectives in their own homes has been carried out in more than 3000 cases; a third of these are engaged in remunerative work. The Council also maintains fourteen occupation and

¹L.C.C. Annual Report of the Council, 1934. Vol. VI. Mental Hospitals and Mental Deficiency. Pp. 64. 1s.

craft centres for the training of defective patients outside any institution, while for the 6000 cared for in hospitals and homes there is educational provision and employment, the extent of which may be recognised from the financial appendices to the report.

RESEARCH

The recognition by the Council of the necessity for more than the routine care of the mentally ill, exacting and primary though it be, is strikingly seen in the passages dealing with research and teaching. The Council is responsible for the maintenance of the only university psychiatric clinic in England; as a centre of post-graduate teaching in this branch of medicine, the Maudsley Hospital occupies a place and influence comparable to that of the Henry Phipps Clinic in the United States. The research carried out there, in the wards and the central pathological laboratory, could hardly have been so active and fruitful if the Council had not shown an enlightened concern for these less obvious obligations. Throughout the mental hospitals, as may be seen from one of the appendices, investigation is pursued into the manifold problems of mental illness along varied and profitable lines. Such evidence disposes of the notion that in mental hospitals lethargy is the doctors' portion, as well as the patients'.

CLEAN WATER PROBLEMS

THE Water Pollution Research Board, in addition to its exhaustive survey of the River Tees summarised in a previous issue (1935, ii., 1322), has engaged in many other activities during the past year. These are briefly described in the annual report, in which is included the report of the director of research, Mr. H. T. Calvert, Ph.D.¹

The work on base-exchange methods of water softening has been continued and materials have been obtained from clays found in Britain which are equal in softening properties to some of the imported materials used for this purpose and are more resistant to disintegration. Experiments with synthetic resins prepared at the Teddington laboratory have shown that some of these possess marked base-exchange properties. Other synthetic resins prepared from aromatic bases such as aniline will remove not cations but anions, so that by the combined use of the two classes the solids in Teddington (equals London) tap water can be reduced from about 33 to 1 part per 100,000, while the same process carried out two or three times will remove most of the salt from sea water. This fact may be of the greatest importance to seamen who, like Bligh of *Bounty* fame, are forced to make voyages in open boats or other small craft where storage for water is so limited that sea water must be distilled, a process which requires not only a still but a supply of fuel to be carried. If Prof. G. T. Morgan and his colleagues can render untrue the words of the Ancient Mariner: "Water, water, everywhere, nor any drop to drink," they will deserve well of all seafaring men.

Work on the activated sludge process of sewage purification goes on under Prof. Topley at the London School of Hygiene. Sludges suited for treatment of special impurities in liquids have been prepared. The effect of bubbling various gases through sewage, directed by Prof. F. G. Donnan at University College,

seems to indicate that the production by this means of thin layers, almost all surface, causes a separation of colloidal matter, whilst simple stirring has some effect in this direction. We know of cases where this action is being tried for improvement of sedimentation. It is, after all, a common laboratory practice to stir a liquid in which a precipitate has been produced, in order to render the separated substance coarser grained and easier to filter.

The officers of the Board do not rely only on the printed word to make the present state of knowledge of water purification known to interested persons. We have before us a summary of a lecture given by the assistant director, Mr. A. Parker, D.Sc., to the Bristol branch of the Society of Chemical Industry. The effluent from a beet-sugar factory of average size (3 or 4 million gallons a day) would, said Dr. Parker, have about the same polluting action on a stream as the sewage of a city of the size of Bristol, and the waste waters of all the factories in this country would be roughly equivalent to the domestic sewage of London. This shows the magnitude of the pollution from a relatively new industry, and explains the many rivers which have been temporarily ruined by it. Investigations completed by the Board have shown that after simple preliminary treatment the waste waters from such works can be used again in the factory processes, leaving little or no effluent for disposal. What effluent there is can be effectively purified before discharge by biological oxidation in percolating filters. Similarly the effluent from dairies and milk products factories in Britain, amounting in wash waters alone to the equivalent of the sewage from a population of 400,000, can be satisfactorily purified by oxidation, assuming that the whey, skim milk, and buttermilk are not run to waste. The story of river pollution is, said Dr. Parker, one of unbalanced development of industry in districts not already industrialised. In many cases the knowledge of purifying processes was available to render the effluents harmless and to prevent not only the disfigurement of our watercourses but the rendering useless of the water for other industries down stream. The methods whereby the discharge of sewage can be rendered harmless cost money, but it is money well spent, and it may be hoped that by systematic research the cost may be reduced.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED
JAN. 25TH, 1936

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2505; diphtheria, 1356; enteric fever, 19; acute pneumonia (primary or influenza), 1376; puerperal fever, 47; puerperal pyrexia, 92; cerebro-spinal fever, 21; acute poliomyelitis, 9; acute polio-encephalitis, 1; encephalitis lethargica, 9; dysentery, 33; ophthalmia neonatorum, 70. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Jan. 31st was 4111, which included: Scarlet fever, 1108; diphtheria, 1081; measles, 578; whooping-cough, 653; puerperal fever, 22 mothers (plus 16 babies); encephalitis lethargica, 282; poliomyelitis, 4. At St. Margaret's Hospital there were 23 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 57 (7) from measles, 7 (1) from scarlet fever, 33 (10) from whooping-cough, 45 (5) from diphtheria, 42 (16) from enteritis under two years, and 104 (20)

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¹ Department of Scientific and Industrial Research. H.M. Stationery Office. 1s.

OBITUARY

SIR JOHN MARNOCH, K.C.V.O., M.B. Aberd.
HONORARY SURGEON, H.M. HOUSEHOLD IN SCOTLAND

THE death occurred on Sunday last in Aberdeen, in his sixty-ninth year, of the well-known surgeon Sir John Marnoch, emeritus regius professor of surgery in the University of Aberdeen.

John Marnoch was the son of the late James Marnock of Aberdeen, where he was born in 1867. He was educated at his native grammar school and



SIR JOHN MARNOCH

[Photograph by Elliott & Fry

university (King's and the Marischal College), and graduated as M.B., C.M.Aberd. in 1891 with the highest honours, having previously taken the M.A. degree. He acted as house physician and house surgeon at the Aberdeen Royal Infirmary, and held similar posts at the Aberdeen Hospital for Sick Children, and was marked out for promotion by being appointed assistant to the professor of physiology in the university. He was elected assistant

surgeon to the Royal Infirmary, promoted quickly as full surgeon, and filled the post of lecturer on clinical surgery at the infirmary. In 1909 he became regius professor of surgery in the university, a position which he held at the outbreak of war. During the war he was in charge of the section of special surgery, 1st Scottish General Hospital, with the rank of brevet-colonel, A.M.S., and in 1915 received the C.V.O. At different times he held local public appointments as medical officer of the Shipmasters' Society and the Gas Corporation, and as secretary of the Medico-Chirurgical Society of Aberdeen, and was also medical assessor of the district under the Workmen's Compensation Act.

From a man, with such medical and multifarious public duties no large literary output could be expected, but Marnoch's earlier contributions to medical literature ranged over a large area, contributions from his pen appearing on various clinical subjects in the *Journal of Anatomy and Physiology*,

in the *Scottish Medical and Surgical Journal*, in the *Annals of Surgery*, in the *British Journal of Surgery*, the *British Medical Journal*, and *The Lancet*. A paper in the *British Medical Journal* in 1909 on treatment of gastric ulcer gave a useful account of the complications and sequelæ as then understood attendant on the treatment of gastric ulcer, while a paper in THE LANCET, published shortly before, formed a practical contribution to the pathogenesis of cancer. The two essays show how thoroughly well and practically informed Marnoch was. He was appointed examiner in surgery at different times in the universities of Edinburgh and Durham, and was a fellow of the Association of Surgeons of Great Britain and Ireland. He was appointed surgeon to His Majesty's Household in Scotland, and a D.L. for his county. In 1928 he was created K.C.V.O., while in 1932, when his position of regius professor of surgery terminated, he was appointed emeritus professor and received the distinction of LL.D. Aberd.

Prof. J. R. Learmonth writes: "It was my misfortune that I did not meet Sir John Marnoch until after his retirement from active surgical practice; yet so profound an impression had he made on professional life in the north of Scotland, and so frequent are references to his judgment and skill, that it is difficult to think of him as other than still in his hey-day.

"For the first eight years of his professional career, Marnoch carried on a general as well as a surgical practice. This experience was reflected throughout his whole life, for it enabled him to understand the social and economic factors that may influence treatment, and his advice was always tempered by an appreciation of these. He could and did understand the difficulties under which practitioners may have to work, and throughout his long and busy life he was ready to help them in these difficulties, irrespective of any financial return for his services. In 1900 he was elected as full surgeon to the Aberdeen Royal Infirmary, and remained in charge of wards for the long period of 32 years. This period saw rapid advances in the possibilities and applications of surgery, and of these he took full advantage. Early in his career, therefore, he acquired an exceedingly large clinical experience. This he constantly tempered by the exercise of his own judgment; and it is to be noted that he brought to this task intellectual qualities of the first order, which his academic record as a student had promised. In consequence, he soon acquired the power of making rapid judgments, and the almost invariable correctness of these has been traditional. To this power he added operative dexterity that was frequently uncanny. He was never obviously in haste, nor was his extraordinary rapidity of a spectacular type. It was part of the man himself: a ruthless shedding of all but the essential steps, and a minimum of movement in accomplishing these. At the end of each operation he had done his best.

"During the years of the war the combination of his military and civil duties, and lack of assistance, laid upon him a burden that must have been well-nigh intolerable. He never enjoyed really robust health; yet the work he overtook so uncomplainingly would have proved too much for many a stronger man. There is no doubt that the incessant toil of these years contributed to his final illness. As a teacher he was essentially eclectic. He taught

(Continued from previous page)

from influenza. The figures in parentheses are those for London itself.

The mortality from influenza is maintained, the total deaths for the last eight weeks (working backwards) being 104, 89, 110, 110, 80, 67, 62, 45. The deaths this week are scattered over 48 great towns, Manchester reporting 8, Birmingham 7, Leeds 5, Liverpool 4, Bolton 3, no other great town more than 2. Liverpool had to report 13 deaths from measles, Manchester 8, Birkenhead and Warrington each 4, Croydon and Salford each 3, Birmingham had 4 deaths from whooping-cough, Birkenhead 3. Deaths from diphtheria were reported from 35 great towns; 3 from Bury, no other great town more than 2.

The number of stillbirths notified during the week was 260 (corresponding to a rate of 41 per 1000 total births), including 31 in London.

fundamentals, and that dogmatically. His aim was to equip his students with a sound elementary framework on which they might build; and no one was better able than Marnoch to select what was needed for the general practitioner; he knew from experience. The same principle of reduction to fundamentals coloured his whole outlook upon the art and craft of surgery; and it is well that there be those who can assess so broadly. Only three weeks ago, alas, I asked him what knowledge had been of greatest service to him in his crowded life. Without hesitation (and Sir John never hesitated, wherein lay his strength) he replied: 'A knowledge of inflammation, its results and its treatment.' This might well become a motto for surgical class-rooms, in an era when students are apt to be enamoured of intricate procedures. Those who knew him will remember well the click of the tongue with which he commented upon, and so surely relegated to their proper place, the 'ingenious' operations that still find their way into surgical literature. To speak colloquially, what he taught, stuck; and it could not escape the notice of a newcomer to the district, that practitioners trained by him constantly made the comment: 'Sir John used to say.'

"It was characteristic of Marnoch that his pleasures and hobbies were simple, and once chosen remained his life-long solaces. He was a skilled violinist, and for many years delighted in weekly quartettes in which his fellow players were invariably the same. As an alternative, he delighted in Highland music, and it is sad to know that his illness separated him from his violin during the years of his retirement. His sport was salmon-fishing, and this he was able to follow until the summer of 1935, when to his great delight he was able to land the biggest fish caught that year in the Spey. In his friendships his early loyalties were lifelong, and ended only by death. His allegiance, once given, was enduring, and carried with it the invaluable attribute of unbiased comment and criticism; of this I speak with gratitude, for frequently I turned to him as one who would give me wise and penetrating advice; and I never turned to him in vain.

"Marnoch's whole life was determined by his intellectual honesty. He was honest in his surgery; honest in his appraisal of it; honest in his dealings with his colleagues; and honest in his dealings with his fellow-men. He would have despised a panegyric as an obituary notice; his view was that he had given due consideration to his duties, and had then carried them out to the best of his ability. How well he succeeded, a generation of students of Aberdeen can testify."

Sir John Marnoch married in 1900 Agnes Holt, daughter of the late Alexander Macdonald, of Garmouth, whose devoted care did so much to lessen the bitterness of physical incapacity during the later phases of his illness. Of their two daughters, the elder is married to a biologist in Melbourne, the younger is the wife of a physician in Toronto.

JOSEPH WILLIAM ROB, O.B.E., M.D. Camb.

Joseph William Rob, who died in London on Feb. 1st, was born at Skipton-on-Swale in 1876, the son of Mr. J. D. Rob, and received his education at St. John's College, Cambridge, where he was a scholar and graduated as B.A. in 1898 with first-class honours in the Natural Sciences Tripos. He proceeded to St. Thomas's Hospital, where he served as house surgeon and graduated M.B., B.Chir. Camb. in 1902, later

proceeding to the M.D. degree. He practised for a time in Thirsk and later at Weybridge, and was medical officer at the Walton-on-Thames Cottage Hospital and the Masonic Institution for Girls. He contributed interesting clinical papers to THE LANCET in 1906 and 1908, and earned a sound reputation as a practitioner.

AMY SHEPPARD, O.B.E., M.B. Lond., D.P.H.

Dr. Amy Sheppard, consulting ophthalmic surgeon to the Elizabeth Garrett Anderson Hospital, died on Jan. 22nd in her 77th year after an illness which had lasted a few months.

The daughter of Thomas Sheppard of Kingswood, near Birmingham, Amy Sheppard was born at Dudley, Worcestershire. She was educated at a private school in Stourbridge, and before taking up medicine, which was at that time still an unusual career for a woman, she studied science at Mason College, Birmingham, now incorporated in the University of Birmingham, whence she matriculated in 1884. She then went to University College, London, and passed the preliminary science examination in 1885 before entering the London (R.F.H.) School of Medicine for Women in October of the same year. She qualified M.B. Lond. in 1892 and decided soon after to specialise in ophthalmology, becoming clinical assistant at the Royal London Ophthalmic Hospital and she continued this work for many years.

In January, 1895, she was appointed assistant physician to the Elizabeth Garrett Anderson Hospital (then the New Hospital), but only held this appointment for a few months, resigning it in the following April to become assistant ophthalmic surgeon to the hospital. In 1898, for no other reason than to prepare herself to give a short course of lectures on public health, Dr. Sheppard took the D.P.H. Camb.; though this diploma had been established more than 20 years before she was one of the first two women to take it, the other being the late Dr. Helen Bittell. In 1906 she succeeded Miss Charlotte Ellaby as ophthalmic surgeon to the Elizabeth Garrett Anderson Hospital, a post which she held for 16 years. Dr. Sheppard was also ophthalmic surgeon to the Medical Mission Hospital at Canning Town and medical examiner to the Girls' Public Day School Trust. By the time the late war started Dr. Sheppard was thus well established in her specialty and when the Military Hospital, Endell-street, run entirely by medical women, was established she accepted the invitation to join its staff in the capacity of ophthalmic surgeon. She also acted as ophthalmic surgeon to the Q.M.A.A.C. at Isleworth, and for these services she was made an O.B.E. in 1919. Dr. Sheppard continued her private consulting practice



DR. AMY SHEPPARD

[Photograph by Elliott & Fry]

proceeding to the M.D. degree. He practised for a time in Thirsk and later at Weybridge, and was medical officer at the Walton-on-Thames Cottage Hospital and the Masonic Institution for Girls. He contributed interesting clinical papers to THE LANCET in 1906 and 1908, and earned a sound reputation as a practitioner.

until the late spring of last year when the state of her health caused her to live more and more at the country cottage near Limpsfield which had already been a week-end resort for many years.

Dr. Sheppard might be called one of the pioneer medical women, since she was only No. 140 on the register of the London School of Medicine for Women. She took the greatest interest in the development of opportunities for women in professional and other work. Though she never joined the militant section of the suffragettes she had sympathy with their activities and lost no opportunity of explaining the need for militant tactics to those who were sceptical. She was prominent among those who made a principle of resisting taxation because they had no vote, and as a result more than once her possessions were sold up. Early in her career Dr. Sheppard paid a special visit to India to study cataract operation by the method of "Jullundur" Smith, and on her return recorded her impressions of this technique in a contribution to the *British Medical Journal*. She was a prominent member of the London Association of the Women's Medical Federation, and when she lived chiefly in London regularly attended its meetings. She was always alert to notice new members or visitors and to put them at their ease with a friendly word. Her rather diffident manner concealed decided opinions and she won the respect of her colleagues on the council of the Association by her pertinacity in sticking to her views on important points of principle, though she was always ready to defer to the opinion of others when no great matter was at stake.

Dr. Sheppard was an expert and very clever gardener with a special interest in the culture of lilies. She had a large circle of acquaintances but few close friends; there was something elusive about her which perhaps added to her charm. She will be greatly missed at the gatherings of the London Association and at the larger parties when members of the council of the Medical Women's Federation are entertained.

**GILBERT EDWARD BROOKE, L.R.C.P. & S.,
D.P.H. Edin.**

NEWS has reached this country from Singapore of the death of Dr. Gilbert Edward Brooke, formerly chief health officer of the Straits Settlements. The son of the late Capt. E. F. B. Brooke, he was born at Hyères in 1873 and educated at Monkton Combe School, Bath, and at the Ouchy School, Switzerland, whence he proceeded to Pembroke College, Cambridge. He graduated at Cambridge as B.A. in 1894, did not pursue the medical curriculum, but continued his studies at the London Hospital, where he was a prominent footballer. He took the triple Scottish qualification in 1897 and later the diploma of D.P.H., and after brief service in the mercantile marine, became Government medical officer to the East Harbour, Turk's Island, West Indies. He was appointed medical officer of health to the Caicos Islands, while at the time of the war he had been port health officer at Singapore for some years, later becoming chief health officer of the Straits Settlements. At Singapore he was lecturer on hygiene to the medical school, acted as examiner in chemistry and physics, and wrote several small text-books on hygiene, parasitology, and sanitary science from the tropical point of view.

In 1920 there appeared from Brooke's pen a well-written "Manual for Ships' Surgeons and Port Health Officers," in which he informed the ship's

surgeon what the sanitary authorities of the port will want from him in the matter of returns, how he can help them most effectively, and how as a consequence he can secure for his ship the shortest delay at quarantine. The double aim of the book was to prevent dangerous conditions from eluding medical observation and to abbreviate periods of detention of the ship that must hamper trade, and the advice was succinct and practical. In the same year there appeared a new and enlarged edition of a work on "Medico-tropical Practice," which had been written some twelve years before and whose favourable reception justified reissue. A communication from him to THE LANCET of March 14th, 1931, set out fully the importance which he considered should be attached to the bills of health carried by sea-going ships, and regretting certain movements made for their abolition. The Far Eastern Health Bureau in connexion with the health organisation of the League of Nations came into existence in 1925 when Brooke was appointed director. His organising work in the collation and distribution of information as to the prevalence of epidemic disease was recognised as of the first value, for the bureau was placed by him in a position to collect regular information from a large number of ports. Similar capacity for strenuous work on organised lines was displayed by him in the construction in Sarawak of a health service; on this he was engaged until the time of his death.

Gilbert Brooke by both his practical labours and literary output, which was large and varied, won for himself a high position in the Colonial Medical Service.

WILLIAM CRAN DUTHIE, M.B. Aberd.

THE death occurred in Blackburn Royal Infirmary on Jan. 24th of Dr. Cran Duthie; he died in the institution with which he was long and valuably associated. The son of the Rev. George Duthie, he was born at Kinkell, Perthshire, in 1871, and was educated at Aberdeen University where he graduated M.B., C.M. in 1893. In the following year he started practice in Blackburn and later was appointed assistant surgeon to the Blackburn Infirmary. He was for 15 years, until his retirement in 1931, a member of the staff where he was popular alike with colleagues and patients, and unanimous expressions of gratitude for his services were expressed by the board on his retirement. Dr. Duthie is survived by a widow and a large family, four of whom are connected with the medical profession, two as doctors—Dr. Lister Duthie being in practice with him—one daughter as a nurse, and another daughter as a radiographer.

**HENRY BULLEN BEATTY, L.R.C.P. & S.I.
SURGEON-CAPTAIN R.N., RETIRED**

Surgeon-Captain Henry Bullen Beatty, who died on Jan. 21st, 1936, at his residence, in Rathmines, aged 75, was born in Dublin, and educated at Wesley College and at the Carmichael Medical School in that city. He obtained the conjoint qualifications of Ireland in 1884, and joined the medical service of the Royal Navy, where he saw much foreign service, first on the west coast of Africa, and later in the South Seas and on the Australian station. In 1904 he was appointed to the Royal yacht, H.M.S. *Osborne*, and after that appointment, from 1908 to 1911, he was surgeon to the Marines at Chatham. Subsequently he served again on the Australian station, and was due to retire in 1914, but owing to the outbreak of the war he was retained in the service until 1917. He returned to Dublin in broken health, but

was able a year later to assist in establishing the earliest Pensions Boards in Dublin. For several years he was engaged in pensions work, acting as chairman of boards, a work for which he was specially fitted by his quick grasp, his knowledge of regulations of procedure, and his judicial mind. Those who worked with him found him a very fair, efficient, and pleasant chairman. During the last five years his health failed badly, and he was rarely able to leave the house, but his interest in world and domestic affairs was unimpaired.

ARCHIBALD ALEXANDER GEORGE DICKEY,
M.B.E., M.D. R.U.I.

Dr. Archibald Dickey, who died on Jan. 19th at the age of 74, was a well-known physician in Colne

and later in Bolton. He was for 33 years in practice at the former centre and for 15 years at the latter, only leaving on his retirement a few months ago. He received his medical education at Queen's College, Belfast, was a scholar and prizeman, took the double Irish diploma, and in 1883 graduated as M.D. R.U.I. At Colne he was in charge of the Military Hospital during the war and was awarded the M.B.E. He was a justice of the peace for the borough, surgeon to the Post Office and the St. John Ambulance Brigade, and honorary medical officer to the Cottage Hospital. When in 1921 he left Colne to practise in Bolton, he held various public appointments and continued his interest in the work of the St. John Ambulance Brigade. He died at the residence, in Pwllheli, of his son, Dr. H. W. Dickey.

MEDICAL NEWS

University of Cambridge

Dr. Samuel Nevin has been appointed to the Pinsent-Darwin studentship for the study of mental pathology. He has lately held a Halley Stewart research fellowship at the National Hospital, Queen-square.

University of London

Prof. H. H. Woollard has been appointed as from Oct. 1st, 1936, to the university chair of anatomy tenable at University College. Since 1929 he has been professor of anatomy at St. Bartholomew's Hospital medical college, having previously held the chair of anatomy at Adelaide University.

The title of reader in pharmacological chemistry in the University has been conferred on Mr. H. R. Ing, D.Phil., in respect of the post held by him at University College.

Dr. Ing was born in 1899, and was educated at Oxford High School and at New College, Oxford, where he graduated as M.A. in 1921 and D.Phil. in 1924. From 1923 to 1925 he was a university demonstrator in organic chemistry at Oxford, after which he went to Manchester with a Ramsay memorial fellowship. In the following year he became research chemist for the Manchester cancer committee, and in 1928 he came to London to take up his present post as lecturer in pharmacological chemistry at University College.

The William Julius Mickle fellowship for 1936 has been awarded to Dr. H. P. Himsforth, deputy director of the medical unit at University College Hospital medical school.

Owing to the illness of Dr. H. M. Traquair, the lectures on Perimetry, which were to have been given at University College Hospital medical school on Feb. 10th and 11th, have been postponed.

Royal College of Physicians of London

At a meeting of the College held on Jan. 30th, with Lord Dawson of Penn, the president, in the chair, it was announced that the Gilbert Blane gold medals for 1935 had been awarded to Surgeon Lieutenant Commander A. A. Pomfret and Surgeon Lieutenant Commander W. G. Fitzpatrick. Dr. Rupert Waterhouse was appointed a representative on the medical advisory committee of the British Health Resorts Association. The Harveian librarian announced the presentation by Prof. Roy Dobbin of a sumptuously bound copy of the manuscript of Ibn Al-Naphis, which dates from the thirteenth century, and in which is the first-known description of the Mechanism of the Lesser Circulation.

Dr. E. L. Middleton will deliver the Milroy lectures on industrial pulmonary disease due to the inhalation of dust, with special reference to silicosis, on Feb. 27th and March 3rd; Dr. R. A. McCance the Goulstonian lectures on medical problems in mineral metabolism on March 5th, 10th, and 12th; Dr. John Parkinson the Lumleian lectures on enlargement of the heart on March 17th and 19th; and Mr. Joseph Needham, Sc.D., the Oliver-Sharpey lectures on chemical aspects of morphogenetic determination on March 24th and 26th.

The following candidates, having satisfied the censors' board, were admitted members of the College:—

Felix Wilfrid Arden, M.D. Adelaide; Sailendra Mohon Basu, M.B. Rangoon; James Frederick Brailsford, M.D. Birm.;

Geoffrey Oswald, Atyeo Briggs, M.B. Camb.; Francis Hayling Coleman, M.B. Camb.; Leybourne Stanley Patrick Davidson, M.D. Edin.; Richard Heyworth Dobbs, M.B. Camb.; Colin Campbell Edwards, M.B. Sydney; David Stanley Fairweather, M.B. Edin.; David George Ferriman, M.B. Oxon.; Alan Morton Gill, M.D. Lond.; Arthur Rupert Hallam, M.D. Edin.; Ernest Arthur Hardy, M.B. Lond.; Herbert Edward Holland, M.B. Sheff.; Philip William Hutton, M.B. Camb.; Alan Leon Jacobs, M.B. Oxon.; Evan Idris Jones, M.B. Lond.; Francis Avery Jones, M.B. Lond.; Edwin James Reid Leiper, M.B. Aberd.; Jack Watson Litchfield, M.B. Oxon.; Leo McGoldrick, M.B.N.U. Irel.; Wilfrid Marshall, M.D. Aberd.; James Lister Newman, M.D. Camb.; John William Osborne, M.B. Sydney; John Scholes Parkinson, M.B. Manch.; Abdel Aziz Sami, M.B. Cairo; Alice Mary Stewart, M.B. Camb.; Charles Henry Stewart-Hess, M.B. Liverpool; Harold Midgley Turner, M.D. Manch.; and Rustom Jal Vakil, M.B. Lond.

Licences to practise were granted to 140 candidates (132 men and 8 women) who have passed the final examination of the Conjoint Board. The following are the names and medical schools of the successful candidates:—

A. W. Abramson, Camb. and St. Thomas's; Ruth M. Addison, Roy. Free; G. W. Alderman, London and Leeds; Sivasithamparam Balasingam, King's Coll.; E. J. W. Barnard, St. Bart.'s; H. F. Barnard, Westminster; A. B. Baxter, Guy's; David Bobker, Charing Cross; E. S. Bompas, St. Thomas's; A. W. Bone, Camb. and London; J. C. B. Bone, Middlesex; R. E. Bonham-Carter, Camb. and St. Thomas's; J. P. Brazil, St. Mary's; B. B. Bridges, Guy's; D. H. D. Burbridge, Middlesex; J. C. Busby, Camb. and St. Mary's; L. S. Calvert, Leeds; Josephine H. Campbell, King's Coll.; W. W. Cashmore, Guy's and Birm.; S. R. Chandra, Calcutta; E. P. Clarke, St. Bart.'s; J. H. Coles, King's Coll.; Kathleen Craddock, Roy. Free; Montague Curwen, Middlesex; C. S. Darke, Guy's; J. E. A. David, Camb. and St. Bart.'s; J. R. Davidson and H. J. Davies, Univ. Coll.; J. N. Deakin, Birm.; G. G. Doel, King's Coll.; B. J. Doran, Guy's; C. A. Dowling, Camb. and King's Coll.; H. G. Earnshaw and R. B. Evans, London; F. I. Firth, Manch.; Robert Fleming, Geneva and London; C. B. Franklin, St. Bart.'s; D. F. Freebody, Guy's; J. E. Garson, Madras and West London; Joyce M. George, King's Coll.; Jaharlal Ghosh, Calcutta and St. Bart.'s; D. R. Gibson, St. Mary's; Sholem Glaser, Cape and London; Louis Greenbaum, London; J. C. Harland, Westminster; H. R. S. Harley, Guy's; G. D. Harthan and John Heginbotham, Manchester; A. G. Hemsley, Middlesex; G. H. M. Hemsted, St. Mary's; R. K. R. Henry, A. G. W. Hill, and B. W. Hunt, Guy's; C. W. Hutt, Camb. and St. Bart.'s; W. G. Hutton, Camb. and Leeds; Mohammed Inayatullah, Agra and Manch.; Meir Irving, Charing Cross; Gwyneth M. Jenkyn-Owen, Roy. Free and West London; A. C. Jones, Middlesex; S. E. L. Kahla, Sydney and London; Ernest Kaplan and H. M. Kelsey, Guy's; K. C. Kershaw, Manch.; F. B. Kierander, St. Thomas's; W. J. Latham, London; L. R. Leask, St. Bart.'s; H. A. Leggett, Guy's; Maurice Lewis, Univ. Coll.; R. N. A. Leyton, Camb. and Westminster; Milton Lipson, Charing Cross; S. E. Littlepage, Manch. and St. Bart.'s; J. M. Lockett, St. Bart.'s; R. D. McDonald, Cape and London; J. T. Mair, Westminster; C. W. Maisey, St. Thomas's; Simon Marinker, Middlesex; H. A. C. Mason, St. Thomas's; Leslie Merrill, Guy's; P. J. W. Mills, St. Bart.'s; A. G. Moore, St. Thomas's; F. T. Moore, St. Bart.'s; Margaret J. Moore, Roy. Free; F. L. E. Musgrave, Guy's; R. O. G. Norman, Camb. and London; J. D. Ogilvie and W. A. Oliver, St. Bart.'s; W. V. Owen, Camb. and Westminster; D. E. Parry, St. Mary's; J. C. Patel, Bombay; N. O. Paterson, Guy's; E. N. Pearlman, Middlesex; John Pemberton, Univ. Coll.; R. R. Prewer, St. Bart.'s; D. E. Price, St. Mary's; Joseph Rabinovitch, Leeds; O. N. Ransford and H. W. Rees, Middlesex; J. L. Reid, Oxon. and Middlesex; Guy Rigby-Jones, Camb. and St. Thomas's; Barnard Robbins, King's College; A. N. Roy, St. Bart.'s; P. S. Sambandam, Madras and West London; L. J. Sandell, St. Bart.'s; H. V. Sankararaya, Mysore and London; Eric Sayle, Guy's; Morris Schwartz, Univ. Coll.; Rupert Solley, Camb. and London; G. C. Steel, Middlesex; D. E. Stephens, Cape and St. Mary's; B. P. Stone, Camb. and King's Coll.; J. S. Stuart, Guy's; F. J. E. Stuhl, Camb. and Westminster; K. H. Sugden,

St. Bart.'s; C. H. Tanner, Cardiff; B. W. Thomas, Univ. Coll.; Dorothy J. Thompson, Camb. and Bristol; T. H. Tidswell, St. Bart.'s; R. C. Tudway, Univ. Coll.; R. G. Tuke, St. Thomas's; J. E. Underwood, St. Bart.'s; G. J. van der Merwe, Cape and Guy's; C. W. H. Van der Post and W. M. Van Essen, Guy's; G. L. Wainganker, Manch. and West London; G. W. Ward, Manch.; J. H. Ward, Camb. and St. Bart.'s; A. G. Waters, Cardiff and London; S. A. Way, Middlesex; Samuel Weinstock, London; J. L. Whately, Birm.; R. R. Willcox, St. Mary's; E. G. Williamson, Camb. and Birm.; Louise F. Wilson, Yale and West London; Anthony Winder, Camb. and London; H. L. Wolfe, St. Bart.'s; L. A. C. Wood, Camb. and St. Thomas's; J. E. Wooding, Camb. and St. Bart.'s; G. N. Wright, Guy's; P. L. Young and W. J. Young, St. Bart.'s.

Diplomas were granted jointly with the Royal College of Surgeons to the following candidates:—

Diploma in Public Health.—S. D. Elliott, R. J. Farnbach, R. A. Jones, G. G. Kayne, W. F. Lane, Catherine E. Murray, C. R. Naidu, and T. S. Rodgers.

Diploma in Psychological Medicine.—J. L. Rates, A. J. Galbraith, J. F. Galloway, S. L. Last, S. A. Mackeith, W. H. McMenemy, K. R. Masani, J. A. Smeal, Alfred Torrie, Rosalind Vacher, and J. H. Watkin.

Diploma in Laryngology and Otolaryngology.—B. T. Bernstein, G. B. Ludlam, R. F. J. Martin, Narayana Srinivasan, T. G. Swinburne, and W. E. Williams.

Diploma in Tropical Medicine and Hygiene.—W. K. Cheng, Anastasio D'Souza, J. S. Gibson, Kalidas Mitra, and V. T. Vagh.

Diploma in Medical Radiology.—E. W. Casey and Frank Ellis.

Diploma in Anaesthetics.—Olive M. Anderson, H. B. Logan, S. D. McAusland, G. R. Phillips, K. B. Pinson, Benjamin Weinbren, H. L. Willey, and C. H. Wilson.

Society of Apothecaries of London

At recent examinations the following candidates were successful:—

Surgery.—R. H. Bembridge, King's Coll. Hosp.; H. A. Koretz, Univ. of Manch.; and G. N. Rodgers, Bombay and West London Hosp.

Medicine.—F. E. Bedell, St. Mary's Hosp.; M. G. H. Jones, Welsh National School of Medicine; and R. L. Walmsley, Univs. of Camb. and Leeds.

Forensic Medicine.—F. E. Bedell, St. Mary's Hosp.; N. Bickford, Middlesex Hosp.; E. E. Evans, Guy's Hosp. and St. George's Hosp.; M. G. H. Jones, Welsh National School of Medicine; and R. L. Walmsley, Univs. of Camb. and Leeds.

Midwifery.—J. D. Anderson, St. Bart.'s Hosp.; G. B. Barbour, Univ. of Camb. and Guy's Hosp.; E. E. Evans, Guy's Hosp. and St. George's Hosp.; E. M. Frankel, Westminster Hosp.; D. L. Jones, Univ. of Liverp.; J. P. McGuire, Calcutta and St. Mary's Hosp.; I. M. Monare, Royal Colleges, Edin.; and C. J. S. Sergel, Univ. of Camb. and St. Mary's Hosp.

The following candidates, having completed the final examination, are granted the diploma of the society entitling them to practise medicine, surgery, and midwifery: G. B. Barbour, R. H. Bembridge, J. P. McGuire, G. N. Rodgers, and R. L. Walmsley.

Scottish Conjoint Board

At recent examinations by the board of the Royal Colleges of Physicians and Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow, the following candidates were successful:—

Eric Greenhalgh, O. S. Sela, Vartheanather Nadarajah, O. W. Marienfeld, N. S. Mohammed, F. H. Wilson, P. C. Burgess, J. H. Lichtenbelt, Harold Jacobs, Edith H. Busse, D. A. S. Martin, L. L. Harrop, Fritz Buchsbaum, Alfred Rosenbaum, Mollereus Couperus, F. J. Beaton, Irving Dolsky, Alexander Crawford, Viktor Klare, R. M. Boveri, H. I. Russek, A. J. Snyder, N. R. Janes, O. K. Kballaf, K. G. Naidoo, Mirajud Din, Emma Pines, Harry Friedman, S. H. Fuchs, K. T. Bluth, Sophia V. Elgey, L. O. Adesigbin, S. F. Auerbach, K. M. El-Moshneb, and W. W. Weir.

Pharmaceutical Society of Great Britain

A meeting of this society will be held at 17, Bloomsbury-square, London, W.C., on Tuesday, Feb. 11th, at 8.30 p.m., when Prof. E. C. Dodds will give a lecture on chemical and pharmacological aspects of the hormones.

Presentations to Medical Men

Kelso.—Dr. A. D. Fleming, who is retiring after 45 years' medical practice, has received a standard lamp from the people of the burgh in recognition of his services to them. *Aboyne.*—A cheque has been presented to Dr. W. Brodie Brown who, after 35 years' practice in the district, has been succeeded by his son. *Hove.*—Dr. H. C. Upton has been given an illuminated address in commemoration of 44 years' service on the governing body of the town, for 27 of which he has been an alderman. He is now 90 years of age. *Uxbridge.*—At the Uxbridge and District Cottage Hospital Dr. George Black was recently presented with a cheque from his colleagues and friends. Dr. Black, who has been in practice in the town for 15 years, is retiring to Hurstpierpoint.

New Hospital for Basingstoke

A good site has been secured for the erection of a new hospital at Basingstoke for which £1800 has been paid.

Hunterian Society

On Monday, Feb. 24th, Sir Lenthal Cheatele will deliver the Hunterian oration of this society at the Mansion House, London, E.C., at 9 p.m. He will speak on John Hunter's Time and Ours. The annual dinner of the society has been cancelled.

Milk for Juvenile Workers

Messrs. Peek Frean and Co. are offering their juvenile workers, some hundreds in number, a one-third-pint bottle of milk at $\frac{1}{2}$ d. per bottle. On Wednesday afternoon the first bottles under this scheme were handed to the workers by the chairman of the Milk Marketing Board.

Developments at Bath

A method is in future to be used at Bath by which the waters can be atomised for inhalation purposes without lowering their temperature. After sterilisation they are carried through a specially designed electric heater. A new kind of aeration bath is also to be installed, which represents a development of the whirlpool bath and offers the advantages of gentle massage.

National Temperance League

On Friday, Feb. 14th, at 5 p.m., Mr. W. McAdam Eccles, consulting surgeon to St. Bartholomew's Hospital, will deliver the second Rae memorial lecture at the London School of Hygiene and Tropical Medicine, Keppel-street, on Progress and Problems. The chair will be taken by Sir Henry Brackenbury, and Mr. Eccles will illustrate the test for the determination of the actual percentage of alcohol circulating in the blood, especially in relation to road accidents.

New Nurses' Home at Hammersmith Hospital

On Tuesday the London County Council considered spending £104,600 in providing new accommodation for the nursing staff of Hammersmith Hospital. Of the 159 nurses now at work there, 82 occupy the nurses' home and a converted block of the former institution, 17 are housed in the administrative block, 33 in other parts of the hospital, and 27 have to live out. The non-resident nursing staff will be increased to nearly 180 when the new ward block is completed and the former institution reconditioned. The new home, to be completed in the spring of 1938, will be a separate building in the north-west corner of the ample site, six storeys in height, and containing 304 separate bedrooms.

Tuberculosis in Russia

The campaign against tuberculosis in the Soviet Union was discussed at a recent All-Union Conference of Tuberculosis Institutes, which decided on the next steps to be taken. Before the late war, it is stated, there were only about 300 sanatorium beds in Russia, together with some special hospital wards and dispensaries supported by charity. The death-rate from tuberculosis was very high, reaching 33.6 per 1000 in St. Petersburg. To-day there are said to be 500 dispensaries in the All-Russian Republic alone, many of them with day sanatoria; over 26,000 beds are available for adults and children in the sanatoria, and special hospitals for the tuberculous, and more than 27,000 physicians are employed in these institutions. Fourteen provincial institutes and a Central Tuberculosis Institute have been established in the same territory, and each year some 500 doctors take special courses on the treatment of the disease.

Appointments

ADAMS, MARY I., M.B. Belf., D.P.H., has been appointed Assistant Medical Officer for Hammersmith.
 CARTWRIGHT, F. F., M.R.C.S. Eng., D.A., Assistant Anaesthetist at King's College Hospital.
 CRITCHLEY, MACDONALD, M.D. Brist., F.R.C.P. Lond., Neurological Physician to the Royal Masonic Hospital.
 DANCY, NAOMI, M.B. Lond., Assistant Medical Officer for Hammersmith.
 LINDSAY, E. C., M.B. Lond., F.R.C.S. Eng., Surgeon to the Royal Masonic Hospital.

PARLIAMENT

NOTES ON CURRENT TOPICS

Voluntary Hospitals (Paying Patients) Bill

In the House of Lords on Feb. 4th the Voluntary Hospitals (Paying Patients) Bill was considered in Committee.

On the motion of Lord LUKE, several amendments, mainly of a drafting character, were agreed to.

The principal amendment made was in Clause 6, Subsection 3. As printed in the Bill this read: "(3) Except to the extent of an application of funds authorised under subsection (2) of section 3 of this Act, an Order authorising the provision or maintenance of any buildings or beds shall not be construed as conferring on the committee of management any power, which apart from the Order would not be exercisable by them, to apply funds in the provision or maintenance thereof."

On Lord Luke's motion, the following new subsection was inserted: "(3) Except to the extent of an application of funds authorised under subsection (2) of section 3 of this Act an Order shall not be construed as authorising any application of funds."

HOUSE OF COMMONS

TUESDAY, FEB. 4TH

Government and the Distressed Areas

Miss WARD asked the Prime Minister whether he was in a position to make a statement to the House regarding the progress made with plans to deal with the distressed areas.—Mr. E. BROWN, Minister of Labour, replied: Considerable progress has been made by the commissioners in a number of directions in promoting the industrial development and social improvement of the special areas since their last reports were published. Further reports for the six months to Dec. 31st, 1935, are expected shortly, and these, too, will be published in due course.

Unemployed Persons and Insurance Benefits

Mr. DOBBIE asked the Minister of Health whether he was aware that many unemployed persons who became voluntary contributors after Dec. 31st, 1932, and who, owing to their economic conditions, were unable to keep up their contributions, had had to allow their insurance to lapse and were outside the scope of Section 14 of the Act of 1935; and, having regard to the serious hardship of having lost all health insurance and pension benefits, what steps would be taken to give this class the benefit of that section.—Sir K. WOOD replied: The only persons who can be in the position referred to by the hon. Member are those who became voluntary contributors after Dec. 31st, 1932, but paid no contributions in respect of any week subsequent to Dec. 31st, 1933. I have no power to deal with such cases generally by Regulations under Section 14 of the Act of 1935, but if any individual case is brought to my notice I will have it investigated in order to see whether on the facts of that case there is any possibility of securing continuity of insurance.

Unhealthy Basements and Condemned Houses in London

Mr. DAY asked the Minister of Health whether he could state, according to his latest reports, the number of unhealthy basements and condemned houses there were in the County of London; what steps were being taken to deal with the same; and the number of families living more than two and more than three in one room, with separate figures for the borough of Southwark.—Sir K. WOOD replied: According to returns obtained by the London County Council in 1934 there were in London 20,108 underground rooms, including 86 in the borough of Southwark, used for sleeping purposes which were deemed unfit for human habitation within the meaning of Section 18 of the Housing Act, 1925. Action for closing such rooms is proceeding: extended powers for this purpose have been given by the recent Housing Act. As regards the second part of the question, I am not clear

what information the hon. Member desires. The total number of houses scheduled for demolition in the programme submitted by the L.C.C. in 1933 is 33,000. Action with a view to demolition has been initiated in respect of 10,500 houses, including 757 in the borough of Southwark. As to the last part of the question the latest particulars available are contained in Table II. in the 1931 census for the County of London.

Road Accidents in 1935

Mr. McENTEE asked the Minister of Transport the number of persons killed and injured in road accidents during 1935, giving separate figures for pedestrian crossing-places.—Mr. HORE-BELISHA replied: Approximately 6550 persons were killed in road accidents in Great Britain in 1935 as compared with 7343 in 1934. Approximately 219,000 were injured as compared with 231,603 in the previous year. 1935 is thus the first year since the war to show an over-all reduction in casualties. Separate figures for fatalities on pedestrian crossing-places will not be known until the fatal accident returns for 1935 have been received and analysed.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Feb. 11th.

Therapeutics and Pharmacology. 5 P.M. Dr. H. P. Himsforth: Physiological Factors Influencing the Action of Insulin. Mr. H. P. Marks, Dr. Levy Simpson, and Dr. M. W. Goldblatt will also speak.

Psychiatry. 8.30 P.M. Dr. E. T. O. Slater: The Inheritance of Manic-depressive Insanity.

FRIDAY.

Clinical. 5.30 P.M. (Cases at 4.30 P.M.) Dr. T. C. Hunt: 1. Persistent (Edema with Cyanosis, ? Nature.

Ophthalmology. 8.30 P.M. (Cases at 8 P.M.) Mr. John Foster: Vitamins in Ophthalmology. Mr. Arnold Sorsby and Miss L. R. Benham: Allergic Tests in External Eye Conditions.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.

MONDAY, Feb. 10th.—8.30 P.M., Mr. C. S. Lane-Roberts:

Treatment of Sterility.

NORTH-WEST LONDON MEDICAL SOCIETY.

TUESDAY, Feb. 11th.—9 P.M. (The Regal Rooms, Regal Cinema, Finchley-road, N.W.), Dr. J. Russell Reynolds:

Cineradiography.

PADDINGTON MEDICAL SOCIETY.

TUESDAY, Feb. 11th.—9 P.M. (St. Mary's Hospital, W.),

Dr. G. B. M. Heggs: Practical Demonstration on Selected Cases of Skin Disease commonly met with in Practice.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.

FRIDAY, Feb. 14th.—8.45 P.M. (Miller General Hospital, Greenwich, S.E.), Dr. Geoffrey Bamber: The Treatment of Some Common Affections of the Skin.

SOUTH-WEST LONDON MEDICAL SOCIETY.

WEDNESDAY, Feb. 12th.—9 P.M. (Bolingbroke Hospital, Wandsworth Common, S.W.), Mr. C. D. Read: The Problem of Abortion and Sterilisation.

NORTH LONDON MEDICAL AND CHIRURGICAL SOCIETY.

THURSDAY, Feb. 13th.—4 P.M. (St. Mary, Islington, Hospital), Dr. W. R. M. Turtle: Clinical Demonstration.

BIOCHEMICAL SOCIETY.

FRIDAY, Feb. 14th.—4 P.M. (London School of Hygiene, Keppel-street, W.C.), Short Communications and Demonstrations.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY.

THURSDAY, Feb. 13th.—8.30 P.M. (11, Chandos-street, W.), Dr. Frank Gray: The Psychopathology of Organic Disease.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.

MONDAY, Feb. 10th.—5 P.M., Mr. G. C. Knight: Intestinal Strangulation.

WEDNESDAY.—5 P.M., Mr. G. F. Rowbotham: A Series of Tumours of the Skull. (Hunterian lectures.)

FRIDAY.—4 P.M., Mr. C. H. Fagge: John Hunter to John Hilton. (Hunterian Oration.)

UNIVERSITY OF LONDON.

MONDAY, Feb. 10th.—3 P.M. (London School of Hygiene, Keppel-street, W.C.), Col. L. W. Harrison: Venereal Disease (II.).

WEDNESDAY.—3 P.M. (London School of Hygiene), Col. Harrison: Venereal Disease (III.).

FRIDAY.—11 A.M. (London School of Hygiene), Dr. A. G. Maitland-Jones: Infant Feeding.

- ROYAL SOCIETY OF ARTS, John-street, Adelphi, W.C.**
MONDAY, Feb. 10th.—5 P.M., Major-General Sir Robert McCarrison: Nutrition and National Health (first of three Lectures).
- HAMPSTEAD GENERAL HOSPITAL, N.W.**
WEDNESDAY, Feb. 12th.—4 P.M., Dr. H. C. Semon: Eczema, Modern Theories and Treatment.
- NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.**
TUESDAY, Feb. 11th.—5.30 P.M., Dr. J. M. H. Campbell: Paroxysmal Tachycardia.
- LONDON SCHOOL OF DERMATOLOGY, 5, Lisle-street, W.C.**
TUESDAY, Feb. 11th.—5 P.M., Dr. H. T. Barron: Common Skin Diseases in Childhood.
WEDNESDAY.—5 P.M., Dr. I. Muende: Histopathology.
THURSDAY.—5 P.M., Dr. J. A. Drake: Some Disorders of Sweating.
- HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.**
WEDNESDAY, Feb. 12th.—2 P.M., Dr. W. G. Wyllie: Pulmonary Fibrosis and Bronchiectasis. 3 P.M. Dr. W. W. Payne: Blood Chemistry in Acute Pulmonary Disorders.
 Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.
- NATIONAL HOSPITAL, Queen-square, W.C.**
MONDAY, Feb. 10th.—3.30 P.M., Dr. Kinnier Wilson: Some Heredo-familial Diseases (I.) Pyramidal.
TUESDAY, 3.30 P.M., Dr. Critchley: Cerebral Vascular Disease (III.).
WEDNESDAY.—3.30 P.M., Dr. Kinnier Wilson: Clinical Demonstration.
THURSDAY.—3.30 P.M., Dr. Carmichael: Myasthenia Gravis.
FRIDAY.—3.30 P.M., Dr. Brinton: Facial Neuralgia.
 Out-patient clinic daily at 2 P.M.
- WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.**
MONDAY, Feb. 10th.—10 A.M., Medical wards and skin clinic. 11 A.M., Surgical wards. 1.30 P.M., Gynecological wards. 2 P.M., Surgical wards, gynecological and eye clinics. 4.15 P.M., Mr. Green Armytage: Hormones in Gynecology.
TUESDAY.—10 A.M., Medical wards. 11 A.M., Surgical wards. 2 P.M., Throat clinic. 4.15 P.M., Mr. Wood Walker: Derangements of Knee-joint.
WEDNESDAY.—10 A.M., Children's ward and clinic. 11 A.M., Medical wards. 2 P.M., Eye clinic. 4.15 P.M., Lecture on anaesthesia.
THURSDAY.—10 A.M., Neurological and gynecological clinics. Noon, Fracture clinic. 2 P.M., Eye and genito-urinary clinics.
FRIDAY.—10 A.M., Skin clinic. Noon, Lecture on treatment. 2 P.M., Throat clinic.
SATURDAY.—10 A.M., Surgical and children's clinics, medical wards.
 Operations, medical and surgical clinics daily at 2 P.M. The lectures at 4.15 P.M. are open to all medical practitioners without fee.
- FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.**
MONDAY, Feb. 10th, to SATURDAY, Feb. 15th.—ST. JOHN'S HOSPITAL, 5, Lisle-street, W.C. Afternoon course in dermatology.—**BLIOMPTON HOSPITAL, S.W.** All-day course in chest diseases.—**CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W.** All-day course in gynecology.—**NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W.** Tues., 8.30 P.M., Mr. A. M. A. Moore: Injuries to Tendons, Muscles, and Joints. Thurs., 8.30 P.M., Mr. E. W. Riches: Kidney and Bladder.—Courses are open only to members and associates of the fellowship.
- SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, WEDNESDAY, Feb. 12th.—4 P.M. (St. James's Hospital, Ouseley-road, Balham, S.W.), Dr. H. Crichton-Miller:** The General Practitioner's Approach to Psychoneurosis.
- LEEDS GENERAL INFIRMARY.**
TUESDAY, Feb. 11th.—3.30 P.M., Dr. Vining: Some Problems in Connexion with the New-born.
- LEEDS PUBLIC DISPENSARY.**
WEDNESDAY, Feb. 12th.—4 P.M., Dr. S. J. Hartfall: Influenza.
- UNIVERSITY OF DURHAM.**
SUNDAY, Feb. 16th.—10 A.M. (Newcastle General Hospital), Mr. G. A. Mason: Selected Chest Cases.
- GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.**
WEDNESDAY, Feb. 12th.—4.15 P.M. (Royal Samaritan Hospital for Women), Dr. Donald McIntyre: Haemorrhage from the Genital Tract.
- Blackburn Royal Infirmary.—H.S. £175.**
Bradford, Municipal General Hospital, St. Luke's.—H.P.'s and H.S.'s. Each at rate of £150.
Brighton, Royal Sussex County Hospital.—Second Asst. Pathologist. £150.
Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.
Cardiff Royal Infirmary.—H.P.'s, H.S.'s, and Cas. O. Each at rate of £50.
Chelsea Hospital for Women, Arthur-street, S.W.—Registrar (Gynecological) and Radium Officer. £75.
City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—Asst. Laryngologist.
Colchester, Royal Essex Counties Institution for the Mentally Defective.—Asst. M.O. £350.
Constance-road Institution, East Dulwich, S.E.—Asst. M.O. £250.
Coventry and Warwickshire Hospital.—Res. Cas. O. £125.
Dewsbury and District General Infirmary.—Sen. H.S. £200.
Doncaster Royal Infirmary.—H.S. to Eye and Ear, Nose, and Throat Depts. £175.
Egyptian Government.—Director of Lunacy Division in P.H. Dept. L.E. 1020 to L.E. 1200.
Evelina Hospital for Sick Children, Southwark, S.E.—H.P. At rate of £120.
Forest Gate Hospital, Forest-lane, E.—First Asst. Res. M.O. £325. Also Second Asst. Res. M.O. £350.
Gloucestershire Royal Infirmary, &c.—H.S. to Ear, Nose, and Throat Dept. At rate of £150.
Halifax Royal Infirmary.—Third H.S. At rate of £150.
Hampstead General and N.W. London Hospital, Haberstock Hill, N.W.—Cas. Surg. O. for Out-patient Dept. At rate of £100.
Hertford, Ware Park Sanatorium.—Asst. M.O. £300.
Hoborn Metropolitan Borough, W.C.—Public Vaccinator.
Hull City Hospital for Infectious Diseases, Cottingham.—Res. M.O. £350.
Hull Royal Infirmary.—First H.S. and Second Cas. O. Each at rate of £150.
Ilford, West Ham Mental Hospital, Goodmayes.—Jun. Asst. M.O. £350.
Infants Hospital, Vincent-square, Westminster.—Res. M.O. £300. Also two Physicians to Out-patient Dept.
Ipswich Sanatorium, Fochall-road.—Asst. M.O. £350.
Kettering Rural District Council, &c.—M.O.H. £800.
Kingston-upon-Hull City and County.—Asst. M.O.H. £600.
Leeds University.—Chair of Physiology. £1000.
Leicester Royal Infirmary.—Sen. Cas. O. At rate of £125.
Lewisham Hospital, High-street, S.E.—Asst. M.O. £350. Also Asst. M.O. £250.
Liverpool, Alden Hey Hospital.—Res. Asst. M.O.'s. Each £200.
Liverpool, Fazakerley Sanatorium.—Res. Asst. M.O. £200.
Manchester, Baguley Sanatorium.—Deputy Med. Supt. £500.
Manchester, Duchess of York Hospital.—Sen. Res. M.O. At rate of £125.
Manchester Victoria Memorial Jewish Hospital.—H.P. At rate of £120.
Metropolitan Hospital, E.—Hon. Surgeon. Also Surg. Reg. Middlesex County Council.—Tuber. M.O. £750.
Miller General Hospital, Greenwiche-road, S.E.—Cas. O. Out-patient Officer. Each at rate of £150. Also H.P. & H.S. Each at rate of £100.
National Hospital, Queen-square, W.C.—Res. M.O. £200.
New End Hospital, Hampstead, N.W.—Asst. M.O. £250.
Northampton County Mental Hospital, Berrynood.—Second Asst. M.O. £450.
Nottingham Children's Hospital.—Res. H.S. At rate of £150.
Nottingham General Hospital.—Cas. O. At rate of £150.
Portsmouth Royal Hospital.—H.P. At rate of £130.
Preston, Sharoe Green Hospital.—Sen. Asst. Res. M.O. Also Jun. Asst. Res. M.O. At rate of £200 and £100 respectively.
Princess Beatrice Hospital, Richmond-road, Earl's Court, S.W.—H.S. and H.P. Each at rate of £110.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Res. Anaesthetist. At rate of £100. Res. Anaesthetist and Dist. Res. M.O. At rate of £90. Also Asst. Res. M.O. At rate of £80.
Royal Chest Hospital, City-road, E.C.—Clin. Assts.
Royal National Orthopaedic Hospital, 234, Great Portland-street, W.—Asst. Res. Surg. for Country Branch. £250.
Royal Naval Medical Service.—Eight vacancies.
St. Andrew's Hospital, Devons-road, E.—Asst. M.O. £250.
St. Bartholomew's Hospital, E.C.—Dental H.S. £80.
St. John and St. Elizabeth Hospital.—Surg. Registrar. £100. Also Clin. Asst., Ear, Nose, and Throat Dept.
St. John's Hospital, Lewisham, S.E.—Med. Reg. to Out-patients. 50 guineas.
St. Leonard's Hospital, Hoxton-street, N.—Asst. M.O. £250.
St. Luke's Hospital, Sydney-street, S.W.—Asst. M.O. £250.
Salisbury General Infirmary.—H.S. At rate of £125.
Sheffield Children's Hospital.—H.S. At rate of £100.
Sheffield Royal Hospital.—Clin. Asst. to Ophthalmic Dept. Also Clin. Asst. to Ear, Nose, and Throat Dept. Each £300.
South Eastern Hospital for Children, Sydenham, S.E.—Jun. Res. M.O. At rate of £100.
Swindon and North Wilts Victoria Hospital.—Res. M.O. £150.
Wakefield, Middleton-in-Warfedale Sanatorium.—Res. Asst. M.O. £350.
Warwickshire County Council.—Asst. County M.O.H. £500.
Western Ophthalmic Hospital, Marylebone-road, N.W.—Hon. Surgeon to Inoculation Dept.
West London Hospital, Hammersmith-road, W.—Half-time Pathologist. At rate of £300.
Westminster Hospital Annex, 66, Fitzjohn's-avenue, Hampstead.—Three Radiologists for Clin. Res. Work. Each £300.
Woodwick and District War Memorial Hospital, Shooters Hill, S.E.—H.P. At rate of £100.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Manchester, South East, Lancs.

Vacancies

- For further information refer to the advertisement columns
- All Saints' Hospital, Austral-street, West-square, S.E.—Res. H.S.** At rate of £100.
Archway Hospital, Archway-road, N.—Asst. M.O. £250.
Barbados General Hospital.—Sen. Res. Surg. £150.
Berley Urban District Council.—M.O.H. £800.
Birmingham, Ear and Throat Hospital.—Third H.S. At rate of £150.
Birmingham, Queen's Hospital.—Bacteriologist and Clin. Pathologist. £600. Also Res. Surg. Reg. £100.

NOTES, COMMENTS, AND ABSTRACTS

THE PHYSICAL BASIS OF
PSYCHONEUROSISPSYCHO-SOMATIC INTER-RELATIONS IN
THE LIGHT OF CLINICAL MEDICINE¹

BY SVEN INGVAR

PROFESSOR OF MEDICINE, UNIVERSITY OF LUND, SWEDEN

FOR centuries the relations between British and Swedish sciences have been close and intimate. I have only to recall my famous countryman, Emanuel Swedenborg, who spent many years here in England until he died in London (1772). Another brilliant representative of Swedish science, Carolus Linnæus, spent a happy and fertile time in this country. Sweden will always remain indebted to English science for its wonderful way of cultivating the spiritual heritage of these two radiant geniuses of the Swedish tongue, through the Swedenborg and Linnean Societies.

British medical science has had a great influence on medical progress in the world through its famous representatives of physiology. I think it is the generally accepted opinion throughout the world that English physiology has for a long time been the leading physiology—I only need to mention such names as Starling, Bayliss, Haldane, Barcroft, Dale, Hill, Adrian. The great progress of clinical medicine during the last decades is in the first place due to the progress in physiology. We have got into the dynamics of the different clinical symptoms, meaning for the patient better diagnosis and better treatment. No man has a greater influence in the evolution of clinical neurology than your Sherrington. Due to the consistent work of him and his school, the clinical neurology of to-day is no longer a mere description of different syndromes, it has become the science of the dynamics of the different nervous symptoms.

On this occasion I speak about the psycho-somatic inter-relations in disease, a subject that has been treated very exhaustively already in the literature from the philosophical, psychological, neurological, psychiatric, as from the viewpoint of general medicine. Recently Flanders Dunbar published a monograph of almost 600 pages with the title: "Emotions and Bodily Changes," quoting no less than 2251 books and papers on the subject. It is significant that Dunbar states in his conclusions at the end of his extensive book that "the time is not yet ripe for writing a text-book on psycho-somatic inter-relations. It is possible," he continues, "that a text-book will never be written," and there is really no endeavour towards synthesis in his book.

Such are the difficulties met in this field. I am treating the subject from my personal experiences as a representative of general medicine. The majority of the workers in this field have been neurologists or psychiatrists, but when neurotic disturbances of internal organs are in question, nobody is more certain to collect experience than the general clinician. The questions form an integral part of general medicine, and in the general clinic the material of so-called organic neurosis is concentrated. Many others who have theorised or

philosophised on the questions have not had the best material, neither has this material been examined according to the demands of the modern clinic.

The Influence of the Emotions

Our psychical life has in various ways a momentous influence on all corporeal functions. Experimental psychologists have convincingly established that even the simplest form of intellectual activity without being emotionally coloured, influences the blood pressure, the distribution of blood in the vascular system, and the tone of the muscles. That the emotions have a very powerful effect is now quite generally accepted and is proved both by clinical observations and experiments. In this connexion it is necessary to mention Cannon's investigations of the influence of emotional conditions on animals. These physiological experiments are naturally of the greatest interest, but the influence of the emotions certainly extends much farther than we can show by physiological analysis. When we see how anguish forces its victim to roam about, how it banishes sleep and the appetite, when we see the flow of tears, the cold sweat and the pallor, we know, without further evidence, that emotion is a very serious business, and penetrates through every fibre of the being. Emotion thus always signifies a strong general alteration in the somatic functions of the body. If, in this manner the effect of psychical influence on the somatic functions is so visible, we are in the first place interested in trying to discover to what extent diseases in the internal organs of the body can arise by emotions, that is, in a psychogenic way—by diseases is meant a change of the anatomical substratum implying an irreversible process, disturbing life manifestations.

As we know the vegetative nervous system innervates the smooth muscles in the internal organs particularly in the walls of the vessels and of the digestive tube, as well as the great glands, and thus it is to be expected that nervous disturbances will appear especially in the smooth musculature in the tubular organs, or in the endocrine glands. A very often quoted German writer, Alkan, has lately proposed a principle of classification along these lines, and indicates various ways by which emotion could cause anatomical changes. Through an abnormal innervation of the muscles in the tubular organs—for example the gut, a cramp or spasm arises in some place, producing a local ischæmia which, if sufficiently intense, leads to ulceration; he instances the gastric ulcer. From such a cramp, in certain circumstances a stagnation easily arises in the proximal part of the tube, which in its turn leads to dilatation, and so the characteristic distensions can come about. Again, sphincteric cramp of the gall-bladder leads to stagnation of the bile, and the resulting change of concentration might cause gall-stones, and, inasmuch as spasm leads to stagnation of infectious material, even severe inflammatory conditions can naturally evolve. So cholecystitis, cholangitis, and colitis by constipation have been explained.

This seems in fact a very simple and in many ways acceptable scheme, but the question immediately presents itself as to how this theoretical plan fits in with our clinical experience. We are furthermore confronted with the question as to why this abnormal innervation occurs in a definite organ, differing for different individuals, why one person gets a spasm in the gullet, another in the pylorus causing stagnation

¹ Lecture delivered before the Hunterian Society on Jan. 20th, 1936.

of food with vomiting, eructations, &c., another a spasm in the urinary bladder, another in the gall-bladder, and so forth. The psychogenic organ—selection in the somatic expression of the neurosis—is a fundamental problem which may be considered here.

The Psycho-analyst's Attitude

This question has especially been a subject of interest for psycho-analysts. They generally hold the view that as neurosis is to be considered as a general state of conflict so the manifestation of neurosis is a protest, and the choice of organ should have some sort of symbolical meaning. Differently talented people choose different musical instruments, similarly different temperaments choose different organs for their neurotic manifestations. That a disturbance in an organ really can sometimes denote a symbolic phenomenon created by pure psychogenic mechanisms, cannot surely be rejected. Reliable gynæcologists report, for example, how obstinate genital bleeding, or genital eczema, has been cured only after the removal of repulsive sexual psychical circumstances. A clinician must however be excused for not accepting a priori the symbolical interpretations of organic neurosis in their entirety, and for trying to fit them in with our further general knowledge of the pathophysiology of the organism.

Defining Neurosis: the Association of Organic Disturbance

If one wishes to define the term neurosis, I understand it as a disharmony of the nervous functions, and from this it is clear that the causes of neurosis must be various. All purely somatic injuries can cause neurosis, over-strain, chronic bodily disorders, intoxications (alcohol), infectious diseases, often cryptogenic. But especially everything which interferes with our will to live and to assert ourselves causes this functional disharmony. In this manner neurosis is the expression of a vital conflict. The more highly developed an individual is the more complicated is this conflict inclined to be. In the modern man one must seek the fundamental cause of neurosis in the social, moral, political, and religious field. It is clear that sexuality, which implies the tendency to lust of life in its highest potentiality must play a most important ætiological rôle. Here moral attitude, philosophy of life, temperament, the finest and most subtle differentiation of the personality are strongly decisive. But we can all be subject to conflicts, and it can undoubtedly be said that we all react neurotically to our conflicts. But from pronounced nervous disturbances, the great neuroses, the majority of us are however fortunately saved. The war has in a most convincing way brought to light, what was not so clearly known before, how our hereditary mass, our internal fundamental structure or constitution, plays a decisive rôle in morbid nervous reaction. All the horrors and psychical torments of the war did not succeed in producing any new nervous disease. Naturally nervous exhaustion was extremely common—not alone among the soldiers at the front—but this appeared generally benign, and when occasion for rest and recreation was found there was a spontaneous and rapid recovery.

We know how with organic brain diseases, typical paralysis or convulsions arise in the muscles of different parts of the body. In this connexion it is pertinent to ask if organic brain lesions also cause disturbances in the internal organs. Examining organic brain diseases from this point of view, one

is, in clinical medicine, instantly confronted with the fact that these occur astonishingly seldom. Organic brain diseases hardly ever cause nervous diseases of internal organs. The epidemic encephalitis, as we have learnt it in the last years, has its anatomical point of attack chiefly in the vegetative centres in the middle brain. One might, for instance, find in epidemic encephalitis characteristic changes in the organism in its entirety, which calls dystrophia adiposogenitalis to mind. In encephalitis there is furthermore often found an increase of salivary secretion and a change of the functions of the sebaceous glands, which gives the face an appearance of having been rubbed with fat, the so-called "oily-face," or the interesting disturbance of the water metabolism, diabetes insipidus, but localised disturbances of internal organs are not a characteristic feature of encephalitis. Neither Wimmer nor Economo tell about these.

It is likewise a clinical fact that organic disturbances play a very small part in epileptic attacks. These may consist of a vasomotor spasm in the brain cortex leading to violent functional discharge which shows itself in unconsciousness, violent muscular cramps, &c. During the fit the muscles of the urinary bladder in particular may contract. This might be in agreement with our knowledge of the bladder's representation in the brain cortex. But localised cramps in smooth musculature of other internal organs are not known to appear in the epileptic attack. It is true also of other serious organic diseases in the brain, for example, brain tumours, that they manifest themselves to a remarkably small extent in the internal organs.

Another circumstance which certainly does not lack significance in the consideration of the difficult psychogenesis problem is organic manifestations in hysteria. This disease also produces characteristic syndromes—paralysis, contractures, disturbance of sensibility, and so forth—which since the time of Charcot have been minutely studied. Modern research has shown that primitive nervous mechanisms released by emotion appear in the manifestations of hysteria. It is thus remarkable that in hysteria symptoms from the internal organs play such a small rôle in the clinical picture as they do. The tendencies of the hysterical personality make it understandable that phenomena like aerophagia followed by loud eructations are for certain individuals an instrument of self-assertion. The same likewise applies to hysterical vomiting. Such phenomena cannot be considered as organic neurosis in a proper sense. It is evident from all extensive compilations in medical literature concerning hysteria (Vorkastner and Kehrer) that hysterical heart, stomach, or intestinal diseases are not known with certainty, and that the hysterical mechanisms, with their tendency to protestation and self-assertion, have no tendency to influence internal organs.

The Great Endocrine Glands

In considering to what degree nervous disturbances of the greater endocrine glands really appear, it may first be stated that we have from the experience of clinical medicine no fixed evidence that diabetes can arise in a purely psychogenic way. For a long time it has been considered certain by some authors that psychic momentum can lead to diabetes: it was very often stressed that certain individuals living under strong psychic tension, business men and others with an anxious life, were disposed to diabetes. It has even been emphasised in medical literature that during great economic crises the

prevalency of diabetes increases—the blood-sugar in diabetes should increase in inverse proportion to the sinking of share prices. Similarly it is alleged that under certain emotional conditions sugar can appear in the urine. It would therefore not be far-fetched to suppose that if a primary psychogenic increase of the blood-sugar is fed emotionally for a long time, we can have degeneration into real diabetes. The experiences of the world war, however, again contradict this, as no definite psychogenic diabetic cases occurred. Umber as well as Gottstein, who have great experience concerning this disease, accentuate this very strongly, and another prominent investigator in the field of metabolic diseases—namely, von Noorden—says that only he who is born to get diabetes gets it. We have nowadays, it appears, the right to deny the existence of emotionally caused psychogenic diabetes. This does not of course interfere with the fact that nervous influences can have an aggravating effect on the disease in question. Everyday clinical experience tells us that. Amongst those who treat diabetic patients it is well known that the blood-sugar increases if the patient gets excited. Cannon found that sugar did not develop in excited animals after removal of the adrenals. Neither the Swedish investigators, Marcus and Sahlgren, nor the Danes, Nielsen and Jörgensen, have, in their extraordinarily exact observations, been able to cause a glycosuria in healthy persons. Widmark has not been able to demonstrate glycosuria in his students before examination. (He interprets this fact as a proof that he is too easy an examiner.) Malmros, in the medical clinic of Lund, has not been able, in such serious situations as the severe final examinations of students or before surgical operations, to find either sugar in the urine or an increase of blood-sugar.

What is said in this connexion about the pancreas also holds good for the thyroid gland. For a long time we have had a definite idea that Graves's or Basedow's disease was often caused by psychic shocks, fright, anxiety, or sorrow. Amongst others, Chvostek champions this idea in his big monograph on this disease.

We have ourselves, in Sweden, for a long time accepted the view, that Graves's disease attacks in the first place women with a nervously exacting profession, such as teachers. Experiences from the war, however, have not with any convincing clearness given support to the idea of a purely psychogenic Graves's disease. The frequency of war-time Graves's disease did not rise in a way corresponding to the emotional stress of the population. In the occurrence of Graves's disease, again the constitution definitely plays an important rôle. That emotional conditions on the other hand play an enormous part in the progress and course of this disease we already understand, as we know that thyroid hypersecretion is one of its main characteristics, and this has in itself a great stimulating effect on the brain, especially on the functions of the vegetative nervous system; and treatment of Graves's disease must be focused perhaps even more on the psychic state of the patient than on the purely somatic symptoms. Stoddard has emphasised that the symptoms of exophthalmic goitre and the anxiety neurosis are exactly the same.

Psychical Factors in Heart and Vascular Disease

An important group of neuroses which in later years in the modern clinic is decreasing in number are the so-called heart neuroses. Lately the prominent German clinician Matthes has treated this problem

and has accentuated the difficulty of relying on the diagnosis of heart neurosis in individual cases. In later years the electrocardiograph in particular has registered a number of disturbances in the heart's rhythm, which for a long time before were interpreted as nervous effects, depending on anatomical lesions in the myocardium. Heart neurosis was according to Kehrer a very little used diagnosis in the German army during the war. In most cases of functional heart disturbances, organic causes could be demonstrated, often among these, constitutional inferiority. The most prevalent of all nervous heart disturbances during the war were palpitations. The front soldiers living in anxious expectation concerning their fate, reacted simply with an increased frequency of the pulse. Sometimes even a low pulse frequency occurred. The effort syndrome of soldier's heart, or as it has been called in U.S.A. neurocirculatory asthenia, that was so to speak rediscovered during the world war, with dyspnoea, palpitation, and heartache is in some people the normal response to excessive fatigue, worry, or emotional stress, and to infection. The heart symptoms are only partial phenomena in a neurasthenic syndrome, and it is misleading and inadequate to consider it as heart neurosis. Dudley White states that there is no tendency for cases with this syndrome either to die prematurely or to develop heart diseases.

The diagnosis of heart neurosis has to take into account all the unmanifested lesions of the heart muscles, chronic septic diseases, degenerative sclerotic processes of the coronary vessels, and also disturbances in the internal secretions. When all these complicated and often subtle processes are properly considered there is not much room left for the conception of heart neurosis.

The influence of psychical factors on the vascular system is confirmed by the well-known fact that vasomotor phenomena play an important part in emotional reactions in general. One of the most common effects of emotions is, as we know, arterial hypertonia, and prolonged psychic tension undoubtedly also gives hypertonia of corresponding duration. The question arises if hypertonia so caused can after a time develop a real hypertension with its typical sclerotic alteration of the arterial system. The answer is by no means clear. Leading authors believe that hypertension begins as a nervous spasm of the arterial system leading to hypertrophy of the arterial walls and of the myocardium, with degeneration and pronounced arterio-sclerotic processes in the body not least in the kidneys. In this way some cases of nephro-sclerosis might develop. Many authors assert that arterial hypertension, so common in our modern times, is caused by psychic mechanisms. It is, however, necessary to state that no definite evidence has yet been produced for the pure psychical genesis, even if it must be regarded to a certain extent as probable. It must be emphasised that even if it has been clearly demonstrated that psychic stress has the effect of raising the blood pressure in a good many individuals there has not been found on the other hand a greater frequency in psychotic patients with depressive emotional states than in normal individuals. Researches of uniovular twins have lately demonstrated to what a large extent the constitutional factor acts in the individual cases in producing arterial hypertension.

Asthma as a Nervous Disease

It is a prevalent idea that bronchial asthma ought to be regarded as a nervous illness, indeed one

often finds it stated in medical literature that it should be treated purely psychotherapeutically. From researches in later years we have now a rather clear conception of the asthma attack as an allergic disease. In accordance with this, we regard it as a general biological reaction of the body to foreign matter, so-called allergens. The reaction localises itself in some individuals, by what is for us an unknown cause, in the respiratory channels. By experimentally induced anaphylactic shocks in guinea-pigs, lung changes directly analogous to those resulting from asthma in the human body can be obtained, also in animals after cutting all nerves to the lungs. From our clinical experience we know that psychical causes play a somewhat important part in initiating an asthmatic attack, and asthma patients are often markedly nervous persons. They belong to the vegetatively stigmatised, if I may use what seems to me an appropriate expression, coined by von Bergman to replace the less adequate conceptions sympathicotonia and vagotonia. Many facts indicate that nervous people with their generally increased reflex irritability, to the influence of surroundings also have a lower threshold for the evolution of allergic reactions. The first asthma attack leaves behind it, probably for ever, a biological change localised in the cells of the respiratory channels. This means a disposition that makes way for a nervous reflex action which afterwards probably can be set in motion in a purely psychogenic way. We know that asthma often causes a strong feeling of anguish or oppression in the patient. It is not illogical to suppose that in certain sensitive pre-disposed patients any disagreeable situation can by degrees induce an asthma attack even without primary allergens. It is highly uncertain whether the asthma attack may even in these circumstances be considered as a direct primary psychogenic reaction. What has been stated, however, does not interfere with the fact that psychotherapy must be given an important place in the treatment of asthma.

The Digestive Apparatus and Psychic Influence

It is a well-known fact that the activity of the digestive tube is to a great extent dependent on psychical influence. This has been proved experimentally in many interesting ways. Katsch observed in rabbits in which an inlaid celluloid window was substituted for part of the abdominal wall that the gut instantly pales and its normal peristalsis stops if the animal is disturbed while eating, frightened, or subjected to pain. When one feeds an animal a lively movement instantly occurs in the whole gut. In Cannon's cats the movement of the stomach stops when they are confronted by an angry dog, and sometimes it takes an hour before any signs of life reappeared in it. Similar phenomena are well known from our clinical experience in human beings; Heyer especially has been able to show by X ray that the functions of the human gut are obstructed under the influence of a depressive state of mind. It is commonly known that fear or great sorrow can cause vomiting reflexes. It is told of the Swedish King, Gustaf the Fourth Adolphus, that he reacted with intense vomitings on learning that he had been dethroned. Bennet and Venables found that in hypnotic subjects to whom suggestions of nausea were made there was an inhibition of the normal rise of the curve of stomach secretion of hydrochloric acid.

If the influence of psychogenic factors on the motility as well as on the secretion of the stomach

is verified in this way, the question then arises as to the extent these factors play in promoting diseases in the stomach. Here a retrospective clinical survey shows that the conception of a nervous stomach disease appears less and less during the last decades. As different subjective stomach symptoms, such as epigastric pains and pressure after meals, gastric hypersecretion, eructations, vomitings, &c., have been discovered to be due to anatomical causes, the gastric ulcer or gastritis, the diagnosis nervous dyspepsia, if not quite rejected, is nevertheless highly discredited.

Recently gastritis, in the examination of which the Danish clinician Knud Faber has done such estimable work, has again come into repute in the clinic. X ray investigations of the mucous membrane in the stomach, which has been worked out to a high degree of perfection by H. H. Berg, together with systematic researches on the gastric juice, and last but not least the introduction of the gastroscope, make it probable that inflammatory processes in the mucous membrane are much more common than we have been inclined to believe. Many new possibilities are thus opened up to the modern clinician to explain the diffuse and abstruse phenomena from the stomach as caused by organic lesions.

One observes from modern theories concerning nervous diseases in the stomach that readily as one formerly gave the diagnosis stomach neurosis, so reluctant is one nowadays to decide what shall rightly be called by this term. We must acknowledge that we have no definite knowledge as to the possibilities of psychical factors in causing primary irreversible processes in the stomach.

Constipation is the commonest of all functional disturbances in the colon. Regarding its causes it is clear that as psychical influences play such a dominating rôle, it must be straightaway regarded as a nervous disease. That joy improves the metabolism and peristalsis of the intestines, while sorrow has a depressing influence was already known to antiquity. It is well known that change of environment, for instance a voyage, is for many people an infallible cause of constipation. Regular living with regular habits play a vital part in the correct functioning of the intestines. We also understand how nervous influences affect the functions of the colon, from the fact that nicotine which has a stimulating influence on the sympathetic nervous system has a laxative effect. Many people improve the functions of the intestines by a morning cigar. Just as thyroid extract has a stimulating effect on the vegetative nervous system, so it also helps to stimulate the movement of the colon and is just the right medicine for certain cases of constipation. For us it is an interesting question as to whether anatomical lesions of the mucous membrane in the colon, such as colitis, can be caused in a purely psychical way. I think we may answer in the affirmative. If stagnation of the contents of the intestine continues sufficiently long, it will cause real inflammation of the colon with diarrhoea. It is an old theory that constipation is one of the chief causes of chronic ulcerative colitis and in the treatment of this disease great attention must above all be paid to the relief of existing tendencies to constipation. It is likewise known that a strong neurotic element can present itself in these patients.

Emotional influences on the functions of the intestines clearly occur in so-called nervous diarrhoea. Particularly women, but men also suffer from the fact that in situations which excite them or cause

fear the intestines react with increased peristalsis and secretion. A suitable name for this phenomenon is "situation diarrhoea." The situation naturally varies for different individuals. Certain people can only sit in an outside seat nearest to the w.c. in the theatre, the consciousness that the nearest way to the latter is clear is sufficient to set the intestines at rest. In other circumstances violent anguish and diarrhoea may occur.

Inasmuch as nervous conditions are reflected in the intestines so nervous disturbances often occur also in the bladder. It is well known that such disturbances make themselves felt in states of excitement.

The Influence of Psychogenic Factors : Summary

From what has been said it follows that from a critical study of the question whether psychogenic factors can directly cause irreversible processes in the organism, there is, according to modern clinical experience, no convincing evidence that it can be so. It has been stressed how organic lesions of the nervous system, even in the vegetative centres in the brain, to a surprising degree, leave the internal organs of the body intact, how also the purely psychogenic mechanisms in hysteria seldom disturb the internal organs, how serious organic diseases which are an everyday experience of the internist play a very small part in the asylums, among psychotic patients, but how the constitutional inferiority plays a vital part in causing neurotic reactionary conditions. It has also been emphasised that as the physiological analysis of disease phenomena is improved by the development of diagnostic methods, so the conception of organic neurosis is more discredited, and where we formerly supposed primary psychogenic mechanisms, we now know that the symptoms depend on primary anatomical processes in the organ which disturb its functions secondarily.

However, we will not claim that our knowledge of pathophysiology has advanced so far as to enable us to reject the possibility that psychogenic factors can sometimes under certain conditions really cause organic changes. Nevertheless it may be wiser to wait and see. Block proves in a reliable way that warts on the hands can be caused to disappear to purely suggestive remedies, by the same simple methods which for a long time have been used by old country women. It is stated by a series of authors that in suitable subjects cutaneous blisters could be produced by hypnotical suggestion. I must be forgiven for my scepticism. I have a strong feeling that the production of these suggested blisters should be the subject of further control experiments.

Anyhow the attempt to fit in disease phenomena in our knowledge of pathophysiology must be given due regard. Without further clear and solid evidence I feel we ought not a priori to interpret organic symptoms as psychical symbols—for instance, constipation must not be taken as a sign of covetousness, nor the convulsion of the epileptic attack be interpreted as a sexual act. Faithful to scientific methods, we must try to explain these and other similar phenomena as somatic expressions of certain released nervous processes in the body, where the organism in its manner of reaction is bound very closely to the nervous structures of its own within reach.

This does not in any way reduce the significance of psychical influence in disease, that is the emotions' importance in the course of any sickness. We must not forget that body and mind are a single unit.

The anatomical organic change produces morbid feeling experienced by the sick person, and this latter is of course a purely psychical process. Here the intimate reciprocity of mind and body is a simple reality. In this manner every disease which disturbs the vital processes is always a psychical process, for all experience contains some psychical element. It is also clear from this starting point that whatever idea is held concerning the genesis of organic symptoms the psychical influence can never be discounted. This conclusion allows free scope for neurotic modification of organic diseases.

We have now a fixed attitude to the interesting question of psychogenic organ selection. We are convinced that emotion is a wave which spreads over the entire organism; we can only see it represented in certain external phenomena such as a distracted expression, pallor, tears, trembling, and so on, but at the same time we feel certain that it is a deeply seated business of the entire organism. We understand that there may be a predisposed state of irritation and that the emotion fixes itself fast there. The fact that some organic lesion often was latent explains that it has for a long time been wrongly concluded that the emotion caused something, whereas it has only *unveiled* the cause.

This general conception induces in us an attitude that will prove highly useful to our patients—we must be very energetic in trying to find out the real cause of any complaint of the patient. If the patient has got some consistent and persistent trouble in any part of his body, it implies some organic lesion, and the symptom should not be discounted as psychogenic or functional and treated purely psychotherapeutically.

Neurosis has been described as a disharmony of the nervous functions, and maintained that neurosis is a vital conflict. It is true of life instinct that it never gives up; a man fights to the last for life. We understand one of the most characteristic marks of neurotic phenomena, intensity and frenzy. Neurosis is not a weakening of the nervous functions but an intensification in the play of reflexes.

That neurosis is the unmasking of an organic lesion means the setting in motion of pathological reflex activity which nearly always takes the form of a vicious circle, and that for the neurotic person is his greatest trouble. Nervous symptoms generate one another and like rolling snowballs they increase with every turn. How far-reaching the effect of this psycho-somatic interaction in neurosis is, in the individual case, depends on many things: the talents, temperament, religious disposition, personality of the person in question. Thus the treatment of neurosis must be very difficult; the situation cannot be really understood if the disturbed organic reflexes are treated as pieces in a puzzle play. Neurosis is a human thing and the organs cannot be treated without considering the entire man. It has recently been stressed from so many different sources that the doctor's profession is before all an art, and sometimes this has been stated in a way which betrays contempt for medical science. As a reaction against the so-called morphological attitude, which medicine has inherited from the great days of the cellular pathologists, this view may be said to have a certain authorisation. But medicine must always remain a true science, the science of human nature. Anyone who undertakes the treatment of nervous organic diseases must take into consideration the experience of clinical medicine and of all medical science; these have been collected with great labour.

THE DIONNE QUINTUPLETS

ALTHOUGH the appearance and daily life of these five attractive sisters has been made familiar to the world at large by the screen and daily press, considerable interest attaches to Dr. Allan R. Dafeo's more technical account of their early life and feeding. He has already (*Jour. Amer. Med. Assoc.*, 1934, ciii., 673) given an account of their birth and immediate treatment, and in the January issue of the *Canadian Medical Association Journal* he carries their medical history to the end of their first year.

Shortly after birth, the five infants were placed in a laundry basket and kept warm by means of blankets heated in the oven; later in the day it was possible to obtain a hot-water bottle, and on the third day an incubator was presented. Finally, there was a separate incubator for each infant; the temperature was at first kept between 87 and 90° F., and then at 84°, and by means of sponges soaked in hot water the humidity was maintained at between 50 and 55. Being born two months before term, the infants had the typical appearance of prematurity, breathed feebly and irregularly, and had frequent attacks of cyanosis and apnoea. Within the first week a cylinder of 95 per cent. oxygen and 5 per cent. CO₂ was obtained, and the gas administered as an "aperitif" before feeds and whenever there was cyanosis. This treatment was continued until they were three months old, by which time 14 cylinders, containing 80 gallons of the gas, had been used! Dafeo gives details of the feeding, and includes a set of weight charts that reflect every credit on all concerned. The Hospital for Sick Children, Toronto, supplied breast milk from the fourth day until the fourth to fifth month, in amounts finally reaching nearly a gallon a day. It is interesting that at one point one of the infants was getting 110 calories per pound body-weight, the daily caloric intake subsequently being gradually reduced to 40 per pound. So far they have been free from infection except for one attack of upper respiratory infection and otitis media, and an attack of gastro-enteritis which affected all five patients. After removal of the infants to the Dafeo Hospital, built across the road from their home in September, 1934, gown-and-mask technique was used continuously by all attendants.

Dr. Dafeo gives a humorous account of the recommendations for feeding and treatment that have reached him from all parts of the world—varying from burnt rye whiskey to sheep's dung in water. He does not emphasise the inevitable difficulties with which he must have been faced in a back-woods home of the type in which the infants were born, nor the continual intrusion of pressmen and sight-seers. One cannot fail to be impressed, however, with the patient, ingenious, and successful way in which the medical care of the infants has been applied.

BILATERAL ECTOPIC PREGNANCY

A case of simultaneous bilateral tubal pregnancy is reported by S. J. de Vletter (*Nederl. tijdschr. v. geneesk.*, 1935, lxxix., 5564). The patient, 35 years of age, had had two other children and four abortions. She was admitted to hospital complaining of acute abdominal pain and slight vaginal bleeding, the menstrual period being a fortnight overdue. The uterus was found to be slightly enlarged and the right tube could be felt as a distinct swelling. The left tube could not be felt. The diagnosis was made of a right tubal pregnancy, and as there were no urgent symptoms immediate operation was not undertaken. Next day there was another attack of pain, with signs of anemia, and operation was therefore performed. Laparotomy disclosed a ruptured right Fallopian tube, with the extended ovum (measuring about 1.5 cm.) lying outside the tube in a mass of blood clot. The rupture was in the isthmus of the tube, which was removed. The left tube was seen to be ruptured at the same spot and was also removed. The patient made an

uneventful recovery. Histological examination confirmed the presence of a bilateral ectopic pregnancy, both ova being apparently of the same age.

CERTIFICATION OF BLINDNESS

A CIRCULAR (No. 1520, 1d.) issued by the Ministry of Health to those responsible for the administration of the Blind Persons Act contains a warning that the method of testing visual acuity by cards is liable to give varying results according to the degree of illumination. Acting on the advice of the Council of British Ophthalmologists, they suggest that artificial illumination should be used in preference to daylight, and that the degree of illumination should be not less than 10 foot candles, setting out a method of obtaining this degree. This is however not one of the main difficulties with which the certifying surgeon is confronted. More important in doubtful or borderline cases of blindness than small differences in the acuity of central vision are defects in the visual field, already restricted when one eye is blind, the presence of nystagmus, and the question whether the blindness is progressive, stable, or capable of being improved by operation, treatment, or time. When all these have been considered, there may still be room for difference of opinion in the interpretation of the phrase "unable to perform any work for which eyesight is essential."

Births, Marriages, and Deaths

BIRTHS

- BAMFORD.—On Jan. 28th, at Ely, Cambs, the wife of Dr. Brian Bamford, of a daughter.
 BUCKTON.—On Jan. 29th, the wife of Dr. P. R. Buckton, of Wymondham, Norfolk, of a daughter.
 CATTERALL.—On Jan. 27th, at Devonshire-place, the wife of Dr. R. C. F. Catterall, of a son.
 GARLAND.—On Jan. 23rd, at Leeds, the wife of Dr. Hugh Garland, of a daughter.
 HENSMAN.—On Jan. 29th, at Devonshire-place, W., the wife of Dr. Stuart Hensman, Buckingham-street, S.W., of a daughter.

MARRIAGES

- KENNEDY—SHEPHERD.—On Jan. 25th, quietly, at Woodford, Essex, Michael Leo Kennedy, M.B. N.U.I., F.R.C.S. Eng., of Huddersfield, to Winifred Pearl Shepherd, of Highfields, Chigwell.

DEATHS

- BATTLE.—On Feb. 2nd, at Horsell Common, Woking, William Henry Battle, F.R.C.S. Eng., Consulting Surgeon, St. Thomas's Hospital, late of Harley-street, London, in his 81st year.
 CHRISTMAS.—On Jan. 30th, at Bozeat, Northamptonshire, Major R. W. S. Christmas, M.R.C.S. Eng., late R.A.M.C., B.E.F.
 FARQUHARSON.—On Jan. 30th, at Chelsea, Stewart Farquharson, M.B. Lond., aged 41.
 FORSBROOK.—On Feb. 3rd, 1936, at Victoria-street, London, S.W., William Henry Russell Forsbrook, M.D.
 LUNN.—On Jan. 27th, at Olton, Birmingham, Cyril R. Lunn, M.B. Birm.
 MACRAE.—On Feb. 2nd, at Newmill, St. Andrews, Farquhar Macrae, M.B. Glasg., consulting surgeon, Western Infirmary, Glasgow.
 MARNOCHE.—On Feb. 2nd, 1936, at 28, Albyn-place, Aberdeen, Sir John Marnoch, K.C.V.O., D.L., LL.D., Emeritus Professor of Surgery in the University of Aberdeen.
 PEARSE.—On Jan. 25th, the result of an accident, Frederick Edward Pearse, M.R.C.S. Eng., L.R.C.P. Edin., of Ripley, Surrey, aged 76.
 PRIDHAM.—On Jan. 27th, at Burgh, Lincolnshire, Charles Fortescue Pridham, B.Chir. Camb., M.R.C.S. Eng.
 ROB.—On Feb. 1st, 1936, in London, Joseph William Rob, O.B.E. M.D., of Outlands Park, Weybridge, aged 59.
 WAUGH.—On Jan. 29th, at Prenton, Birkenhead, Alexander Waugh, M.B. Glasg., aged 71.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

GREENOCK HOSPITAL.—Provost Bell, on Jan. 27th, cut the first sod on the site of the Rankin Memorial Maternity and Children's Hospital at Greenock. The hospital is being given to the town by Miss M. D. Rankin at a cost of £40,000 and it is expected to be finished within eighteen months. It will have room for 56 beds.

ADDRESSES AND ORIGINAL ARTICLES

THE TREATMENT OF
**PERNICIOUS ANÆMIA WITH DAKIN
 AND WEST'S LIVER FRACTION**

(ANAHÆMIN)

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IN 1926 Minot and Murphy¹ reported their epoch-making discovery of the value of liver in the treatment of pernicious anæmia. The difficulty which patients who were seriously ill found in eating 250 grammes of liver daily made it desirable to prepare concentrated extracts from the whole organ. The first successful concentration of the active fraction was achieved by Cohn, Minot, and their co-workers² who demonstrated that the daily oral administration of a powder weighing 12 g. (fraction G derived from 400 g. of liver) was as effective for blood formation as 250 g. of whole liver.

By elaborate chemical procedures this fraction was further purified, until material injected intravenously in doses as small as 0.025 g. daily would produce a maximal regenerative effect on the blood. General use of this product was not practicable because of its high cost, resulting from the loss of large amounts of active principle during fractionation. Accordingly Castle,^{3,4} using a simple solution of the fraction G of Cohn and also Gänsslen,⁵ prepared inexpensive products effective when injected intramuscularly in daily amounts derived from 5 to 20 g. of liver. Given by injection the extracts were 30-100 times more potent than when given by mouth. Attempts to isolate the liver principle in a state of complete purity have been hampered by the fact that the product is easily inactivated by chemical processes and by the lack of a reliable laboratory test for activity.

Recently a further stage in the concentration of the active principle has been announced by Dakin and West.⁶ For details of the complicated chemical processes involved the reader is referred to the original paper by these workers. The method employed in making the product used in the present investigation was essentially similar, fraction G (Cohn)² being treated with alcoholic calcium acetate to remove inactive material and subsequently concentrated by successive precipitation with ammonium sulphate, Reinecke salt, and finally ammonium sulphate again.

To this product the name Anahæmin has been given. It is a clinically potent light buff-coloured granular powder. When prepared from Cohn's fraction G a yield of 1 per cent. is obtained. The material is soluble in water and dilute alcohol, but insoluble in absolute alcohol and in ether. Dakin and West found that on hydrolysis it yielded an amino-hexose and a number of amino-acids—namely,

lysine, arginine, glycine, leucine, hydroxyproline and aspartic acid. Pyrimidine or purine bases were absent. The substance was slowly decomposed by pepsin and more rapidly by erepsin. Pancreatic juice had no effect upon it. Intramuscular or intravenous injections of 75 to 150 mg. have produced maximal reticulocyte responses.

A supply of anahæmin has been prepared by The British Drug Houses Ltd., under the direction of Mr. F. H. Carr, D.Sc., who originally suggested to Dakin and West the possible value of ammonium sulphate in the process of fractionation. The material was supplied in solution in ampoules containing 100 mg. per c.cm.

We were asked by the Medical Research Council to carry out the present investigation in order to determine the potency of the Dakin and West liver fraction, anahæmin, and to compare its hæmatological and clinical effects with those produced by other (less purified) concentrates. The advantages gained by simultaneous investigations at three centres were the increased number of cases obtained in a limited period and the correlation of independent observations.

It might be asked why, when potent preparations are already available, intensive research is still required into the purification of the active principle. There are at least three reasons why investigations in this direction are necessary.

(1) Increased concentration should permit the use of smaller quantities and longer periods between injections.

(2) Until the material is obtained in its pure state there is no possibility of its synthesis, a process which might lead to a marked reduction in the cost of treatment.

(3) There is the obvious desirability from the scientific point of view of investigating the influence of the pure substance not only upon blood formation, but also upon certain neurological and other phenomena associated with the syndrome of pernicious anæmia.

Progress is hampered by the scarcity of suitable cases of pernicious anæmia in relapse, and we take this opportunity of asking practitioners to refer such patients to hospital whenever possible. At the same time we acknowledge with gratitude the coöperation of those who have already permitted the investigation of patients under our care.

MATERIAL

A total of 36 cases has been treated, details of the first 23 being included in Table I. For brevity, clinical and biochemical findings other than those necessary for the present analysis are omitted, but every case was fully investigated and conformed to the criteria demanded for the diagnosis of Addisonian pernicious anæmia. In no instance was free hydrochloric acid present in the gastric juice even after histamine stimulation. Before commencing treatment a control period without therapy was observed. A diet low in meat and other sources of extrinsic factor was given during the period of investigation.

Results

CLINICAL FINDINGS

By the third to sixth day there was in most instances a feeling of well-being and a return of appetite, this subjective improvement frequently being less marked or delayed in patients with red blood-cell counts above 2 millions per c.mm.

Although in two instances soreness of the tongue persisted for more than 20 days, in most cases it had

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TABLE I.—CASES AND RESULTS

No.	Case, age, sex.	Initial R.B.C. millions per c.mm.	Amount of material given. (d. = days.)	Reticulocyte response, per cent.			Increase in R.B.C. (millions per c.mm.).					Arterio-sclerosis, infection, &c.	Remarks.
				Actual peak.	Day	Expected maximum.	Days.						
							10	20	30	40	50		
1	F. T., 53, male.	0.91	10 mg. from 0 to 9 d.; 20 from 11 to 20 d.; 30 0 a t 31 d.	33.2 32.2	9 10	50.6 38.0	0.74	1.76	2.21	3.21	3.34	—	Given amm. sulphate precipitable (less purified) material from 11 to 20 days.
2	B. R., 56, male.	1.68	100 mg. at 0, 18, 36 d.	43.0	6	29.4 18.7	0.39	0.49	1.19	1.39	1.58	Syphilis, aortic aneurysm.	S.T. ceased. P. in fingers ceased.
3	H. M., 46, fem.	1.20	100 mg. at 0 d.; 300 at 38 d.	27.3 +	4	41.5 29.0	1.86	2.50	2.50	2.66	3.25	—	P. ceased.
4	A. M., 47, fem.	0.97	150 mg. at 0 d.; 400 at 20 d.	29.0 30.0 30.4	6 7 8	47.4 34.6	0.86	1.54	1.64	2.27	2.32	Chr. arthritis (afebrile), B.P. 152/90.	Vib. absent legs.
5	B. W., 66, male.	1.90	200 mg. at 0 and 39 d.	—	—	—	0.38	1.29	1.76	1.73	2.43	—	S.T. persisted 20 days. P. in hands much less. S.C.D. no change.
6	C. A., 75, fem.	1.13	200 mg. at 0 d.; 600 at 18, 28, 38 d., then wkly.	25.8	6	44.3 31.7	0.54	0.61	0.96	1.42	1.70	Subacute cholecystitis, R.A. thickened, tortuous. B.P. 175/95 (7th week).	P. below knees ceased 2nd week. Died after cholecystectomy.
7	F. C., 62, fem.	1.91	200 mg. at 0 and 28 d.	—	—	—	0.61	1.22	1.66	2.01	2.26	—	S.T. ceased. P. ceased.
8	P. M., 55, fem.	1.38	200 mg. at 0 and 21 d. 600 wkly. from 28 d.	28.4 28.8	6 7	36.2 24.3	0.80	1.70	2.14	2.74	2.88	Pyorrhœa marked.	P. to wrists and ankles ceased. S.C.D. much improved.
9	M. I., 44, fem.	1.61	200 mg. at 0 d.; 300 at 21 and 28 d.; 200 on alt. d. from 31.	17.0 +	5	31.5 20.4	0.87	1.15	1.82	2.32	2.67	—	P. below knees less. S.C.D. improved.
10	S. W., 72, male.	1.36	200 mg. at 0, 20, 29, 39 d.; 1000 at 49 d. Iron from 69 d.	35.4	7	36.2 24.3	0.88	1.10	1.43	1.95	2.38	Dental sepsis slight. R.A. thickened. B.P. 130/75.	P. to ankles ceased 10th week. Absent K.J. and A.J. Vib. doubtful.
11	E. C., 64, male.	1.82	200 mg. at 0 d.	11.0	5	27.3 17.1	1.11	1.81	2.39	—	—	—	P. in fingers much less. Slight ataxia less.
12	G. G., 63, male.	1.47	200 mg. at 0, 21, 43 d.	24.6 24.0	4 5	33.8 22.3	1.30	1.72	2.10	2.56	2.80	R.A. thickened. B.P. 160/70.	—
16 B	P. H., 56, fem.	1.60	300 mg.	(16.3)	(10)	—	1.69	1.88	2.20	2.56	—	See Case 16.	—
13	W. W., 68, male.	1.21	400 mg. at 0 d.	35.0	6	41.5 29.0	0.91	1.64	2.18	2.60	—	Dental sepsis slight. R.A. thick and tortuous. B.P. 135/65.	P. to elbows and knees. Psychosis developed 5th week. S.C.D. slight, improved.
14	C. S., 35, fem.	1.31	400 mg. at 0 and 21 d., and wkly. from 30 d.	25.2	5	38.8 26.5	1.10	1.72	2.14	2.52	2.67	—	S.T. ceased. P. to wrists and below umbilicus decreased to finger tips and soles. S.C.D. slight improvement.
6 B	C. A., 75, fem.	1.54	600 mg.	(11.4)	—	—	0.45	—	—	—	—	See Case 6.	—
15	C. E., 43, male.	2.55	100 mg. at 0 d.; 600 at 11 d.; 500 at 21, 29, 36 d.	4.3 (4.2)	6 (13)	14.1 7.5	0.02	0.67	1.19	1.38	1.52	Pyorrhœa slight. R.A. thickened. B.P. 122/72.	S.T. ceased 3rd day. No true P.—“dead fingers” only.
16	P. H., 56, fem.	2.13	100 mg. at 0 d.; 300 at 19 d.	7.8 (16.3)	7 (29)	21.8 12.9	0.18	loss	1.16	1.42	1.71	Marked arterio-sclerosis. Cerebral vascular lesion. B.P. 220/110.	P. in fingers ceased. Old hemiplegia.
17	J. R., 62, male.	2.56	100 mg. at 0 d.; 400 at 11, 21, and 36 d.	8.0	7	14.1 7.5	0.35	0.84	1.17	1.45	1.57	Pyorrhœa. R.A. sl. thickened. B.P. 164/94.	S.T. ceased. P. to wrists and umbilicus less. S.C.D. sl. improvement.
2 B	B. R., 56, male.	2.15	100 mg.	—	—	—	0.60	0.88	—	—	—	See Case 2.	—

ceased altogether by the end of the first week. This prompt relief of sore tongue by Dakin and West's liver fraction, which from its chemical nature and mode of preparation is unlikely to contain any of the known vitamins, is interesting in view of the theories of Hutter, Middleton, and Steenbock⁹ and of Groen,¹⁰

who suggest that the tongue changes in pernicious anæmia are due to deficiency of some portion of the vitamin-B complex.

Gastro-intestinal symptoms such as epigastric discomfort, vomiting, and diarrhoea usually cleared up in the first ten days. The rapid gain in weight¹¹

TABLE I.—(continued)

No.	Case, age, sex.	Initial R.B.C. millions per c.mm.	Amount of material given. (d.=days.)	Reticulocyte response, per cent.			Increase in R.B.C. (millions per c.mm.).					Arterio-sclerosis, infection, &c.	Remarks.
				Actual peak.	Day	Expected maximum.	Days.						
							10	20	30	40	50		
10 B	S. W., 72, male.	2-11	200 mg.	—	—	—	0-30	—	—	—	—	See Case 10.	—
18	R. G., 65, male.	2-21	200 mg. at 0, 19, 23, 39 d.	9-6 9-0	5 6	20-1 <i>11-6</i>	0-45	0-93	1-40	2-18	2-08	Chr. bronchitis. R.A. thickened. B.P. 150/85.	—
19	H. M., 62, fem.	2-35	200 mg. at 0 and 37 d.	—	—	—	0-62	1-07	1-07	1-17	2-15	—	—
20	R. E., 51, fem.	2-34	200 mg. at 0, 20 d. Iron at 36 d.	18-0	6	18-5 <i>10-5</i>	0-62	1-14	1-47	1-94	2-08	—	Occasional P. legs ceased. Vib. absent legs.
21	U. L., 42, fem.	2-63	300 mg. at 0 and 21 d.	3-2	6	14-1 <i>7-5</i>	0-44	0-37	0-57	—	—	Osteo-arthritis.	No P. K.J. absent. Vib. absent or diminished.
22	R. J., 34, fem. (aver.)	2-12	300 mg. at 0 d.; 500 at 20 and 48 d.	27-8	9	21-8 <i>12-9</i>	0-47	1-21	1-33	1-81	1-91	—	S.T. severe till 22nd day. Recurred on 47th. Tingling to elbows worse at first; less after 40th. No definite S.C.D.
23	B. E., 55, fem.	2-24	100 mg. at 0 d.; 200 at 6 d.; 100 at 28 d.	3-0 3-0	9 10	20-1 <i>11-6</i>	0-95	1-76	1-83	1-58	1-36	Simple goitre.	S.T. persisted.
4 B	A. M., 47, fem.	2-51	400 mg.	—	—	—	0-10	0-73	0-78	—	—	See Case 4.	—
15 B	C. E., 43, male.	2-57	600 mg.	(1-2)	(2)	—	0-64	—	—	—	—	See Case 15.	—

Abbreviations.—R.B.C.=red blood-cells. B.P.=blood pressure (systolic and diastolic). R.A.=radial arteries. S.T.=sore tongue. P.=paræsthesia. S.C.D.=subacute combined degeneration. K.J.=knee-jerks. A.J.=ankle-jerks. Vib.=vibration sense. Sl.=slight. D. & W.=Dakin & West.

EXPLANATORY NOTES FOR TABLE I

"Days" in every instance refers to days after the commencement of treatment, the day of the initial injection being "0."

Reticulocytes.—Where the summit of the response was a "plateau" rather than a "peak," counts closely approximating to the maximum are given. The + sign in Cases 3 and 9 indicates that the actual maximum was probably higher than the recorded figures, the reticulocyte count not having been made daily in these two instances. The expected maxima are those calculated by Bethell and Goldhamer⁷ for intravenous injection of liver extract. Actual calculations for intramuscular injection are not yet available. The expected maxima for oral liver therapy (Riddle⁸) are given in italics.

Red blood-cell increases attributable to the injection of a single dose are printed in heavy type. At the time of the second injection in Cases 2, 4, 6, 10, 15, and 16 the red blood-cell increase following the first dose had ceased and the erythrocyte level remained below 3 millions per c.mm. These cases are included in the table for a second time (e.g., as Case 2 B) in order to show the rate of red blood-cell increase produced by the second dose. Secondary reticulocyte responses produced by second doses of material are given in parentheses (e.g., in Cases 16 and 16 B).

A column is included for "arterio-sclerosis and infection," since these factors have been shown to influence the response to treatment.

Under the heading "Remarks" the presence and the effect of treatment upon sore tongue, paræsthesia, and neurological phenomena are recorded. When not specifically mentioned such manifestations were absent. Further details of the neurological findings are given later in this paper under "Discussion."

Order of cases.—The cases have been divided into two groups: those with initial red blood-cells below 2 millions and those with initial counts at this level or above it. In each group the cases are arranged according to the amount of Dakin and West's fraction given in the first 10 days. Cases receiving similar amounts of material are put in order of 10 day increase of red blood-cells.

Sheffield cases: 5, 11, 19, and 2 others.

Aberdeen cases: 2, 3, 7, 9, 16, 20, 21, 23, and 6 others.

Newcastle cases: 1, 4, 6, 8, 10, 12, 13, 14, 15, 17, 18, 22, and 5 others.

The initial dose in Cases 8 and 10 and the first two doses in Cases 12 and 18 were given intravenously, but all other injections were made intramuscularly.

REACTIONS

When a second intravenous injection was given Case 18 suffered from pains in the limbs and back, flushing, and intense dyspnoea as if from bronchospasm. The symptoms ceased within half an hour of the injection. Under similar circumstances Case 12 had merely a flushing of the skin. Except for an occasional rise of temperature to 99° F. no other reactions were observed.

which frequently accompanies a remission, however induced, was observed in this series also.

Transient paræsthesiæ often brought on by exposure to cold and sometimes associated with obvious circulatory disturbances in the extremities—e.g., “dead fingers”—passed off within the first two weeks. More constant numbness and tingling, probably nervous in origin, decreased in extent and intensity after a variable period in every instance (see Table I.).

Objective neurological findings were observed in 12 instances. Cases 4, 10, 20, 21, and 22 showed merely diminished or absent vibration sense with or without depression or absence of deep reflexes; except for minor alterations in reflexes no significant changes were observed.

The effect of treatment in Cases 11, 13, and 17 showing evidence of subacute combined degeneration, but of relatively slight degree, is sufficiently indicated in Table I.

There were four patients with moderately severe subacute combined degeneration of the cord. Case 5 had less numbness and tingling, but showed no change in objective findings after 50 days, having received only 400 mg. in that time. In Case 14 paræsthesiæ diminished and gait improved, but at the sixty-sixth day the physical signs were little changed. Although still ataxic a patient (Case 9) who was unable even to stand can now walk for short distances without help. Spasticity has decreased but the plantar reflexes remain extensor. Incoördination and loss of cutaneous sensibility are less. Case 8 was remarkable in that after ten weeks the patient was free from paræsthesiæ, cramps, incontinence of urine, and dysfunction of the hands. The memory had become normal. The gait became quite steady and she was even able to run. Romberg's sign was negative. The plantar responses which until the eighth week had been clearly extensor thereafter became flexor in type. Depressed deep reflexes were more readily obtainable. Vibration sense returned in the spine, pelvis, and lower extremities with the exception of the toes, and cutaneous sensibility in the feet improved.

The fact that symptoms and signs of subacute combined degeneration improved during treatment with such a highly purified liver fraction is of considerable theoretical interest. Should the results be confirmed in a larger series of cases it will show that the hypothetical cord factor, if not actually identical with the hæmopoietic liver principle, must at least be allied to it chemically.

RETICULOCYTES

Up to a point, the height of the reticulocyte peak after the administration of any active substance increases with the quantity of material administered, but for a given initial red blood-cell count there is a maximum reticulocyte response which is rarely exceeded however great the amount given. The smallest quantity of material required to produce such maximal responses has been used as a measure of potency,¹² a matter to which further reference will be made. Table II. indicates the degree of reticulocyte response which followed the administration of varying amounts of Dakin and West's liver fraction anahæmin, figures for commercial liver extracts and for Dakin and West's own series being included for comparison. The reticulocyte response is described as good, moderate, or poor. Standard reticulocyte responses for the intramuscular route which was used in most instances are not available, but judging from published data¹² it seems that the maxima usually fall somewhere between those for intravenous

and those for oral therapy. An arbitrary line midway between the maxima for intravenous⁷ and for oral liver therapy⁸ has therefore been chosen, “good” responses being those which reached or exceeded this level. “Poor” responses are those which fall below an arbitrary level three-fourths of the maximum for oral therapy. “Moderate” refers to peaks falling between the two levels mentioned.

TABLE II
Reticulocyte responses according to dose

—	No. of cases.	Good.	Moderate.	Poor.
150 mg. or less ..	8	1 (12·5)	4 (50)	3 (37·5)
200 mg.	8	2 (25)	5 (62·5)	1 (12·5)
300 or 400 mg. ..	4	2	1	1
Total for present series	20	5 (25)	10 (50)	5 (25)
Campolon 10 c.cm. or Pernamon Forte 10 c.cm. (Ungley) ..	9	4 (44·4)	4 (44·4)	1 (11·1)
Campolon, Hepatex, or Lilly Ext. 2 to 5 c.cm. daily (Davidson) ..	6	3	1	2
Total	15	7 (46·7)	5 (33·3)	3 (20)
Dakin and West's series (75 to 150 mg.) ..	16	10 (62·5)	5 (31·25)	1 (6·25)

Percentages are given in parentheses.

A comparison with the figures for massive doses of commercial liver extracts shows that the percentage of “good” reticulocyte responses to 2 c.cm. of anahæmin (100 mg. per c.cm.) is lower than that produced by single injections of 10 c.cm. of Campolon or Pernamon Forte, or daily injections of Campolon, Hepatex, or Lilly's extract (see Table II.). There are not sufficient data available for doses in excess of 200 mg. The reticulocyte responses obtained by Dakin and West⁶ are referred to later.

INCREASE OF RED BLOOD-CELLS

It is well recognised that cases with a high initial red blood-cell count show a smaller rate of increase in erythrocytes than cases with a low initial level. An analysis of our data shows that this reduced rate of blood production is as apparent in cases starting with a high initial count as in cases which have reached a high level consequent upon previous treatment. When assessing the rate of red blood-cell increase in a given period produced by differing kinds or amounts of material, it is therefore desirable to confine comparison to cases with approximately similar initial levels. An idea of the rate of increase to be expected from adequate therapy may be gained by reference to Table III. which shows the response to oral and parenteral liver therapy in other series of cases. The initial level of red blood-cells in cases receiving anahæmin (1·55 to 1·57) was somewhat higher than in those receiving other liver extracts (1·2 to 1·37). Such a small difference in initial level can only have a slight effect on the rate of increase in 10 to 20 days (see Bethell's¹⁴ paper, Fig. 5). Details of the effects produced by varying doses of the Dakin and West fraction are given in Table I. Doses amounting to 150 mg. or less in the first 10 days were given in four cases having initial red blood-cell counts below 2 millions. There was an extremely rapid increase of red blood-cells in Case 3, a moderate increase in Cases 1 and 4, and a poor response in Case 2. Cases 15, 16, and 17 with initial counts over 2 millions showed very little response and Case 2B showed a

moderate response. The results are too variable and too few for purposes of comparison or statistical treatment.

Eight cases (Nos. 5 to 12) with initial red blood-cell counts below 2 millions received 2 c.cm. of anahæmin (100 mg. per c.cm.) as a single dose. The rise of red blood-cells was variable, lasting as a rule for from two to three weeks. On the average the increases in 10 and 20 days were similar to those produced by the administration of large amounts of

by the fact that the rates of increase are higher than those shown by the large number of cases in series v., receiving optimal amounts of liver extract intravenously.

The increase of red blood-cells in 20 days is distinctly less than that which follows the daily administration of extract 343 (fraction G of Cohn) derived from 500 or 600 g. of liver, and slightly exceeds that which is to be expected after the daily oral administration of extract 343 from 250 g. of liver¹³ (see Table III.). It may be concluded that the optimal single dose for rapid production of red blood-cells in 10 and 20 day periods is in excess of 200 mg.

Two out of three cases receiving 300 mg. at an initial red blood-cell count of over 2 millions (Nos. 21, 22, 23) had a greater increase at 20 days than the three cases with a similar initial level receiving 200 mg., but Case 4 B receiving 400 mg. from a red blood-cell level of 2.51 millions showed a poor response. Only three cases (Nos. 16 B, 13, and 14) had 300 or 400 mg. at an initial red blood-cell level sufficiently low for adequate test, and all three gave a good response. The data for doses of 300 and 400 mg. are not sufficient however to indicate whether in the average case such initial amounts are likely to be optimal for the production of red blood-cells at a maximal rate.

On the other hand, there were 11 patients with initial red blood-cell counts below 2 millions per c.mm. who received 100 to 600 mg. (average 359 mg.) in a period of 36 to 40 days. Cases with various initial red blood-cell counts below 2 millions receiving similar amounts of material tend to have much the same level after five weeks.¹⁴ It is significant therefore that not only are the rates of increase in this series of the same magnitude as those produced by large doses of campolon, but the final counts after 40 days are almost identical (Table III., Series III. and IV.). (It would of course be incorrect to conclude that 1 to 6 c.cm. of anahæmin were quantitatively equivalent to 30 to 82 c.cm. of campolon, because these quantities of campolon may have been more than were required to produce the effect attained.) Bethell's¹⁴ 79 cases receiving a regular weekly intravenous injection of 10 to 20 c.cm. of liver extract showed a considerably greater gain in 35 days than either of these series (Table III., Series v.).

Figures for red blood-cell increase are available in only 3 of the 20 cases reported by Dakin and West,⁶ but it is noteworthy that in their series 75 to 150 mg. were usually followed by a maximal reticulocyte response. It would appear possible that the material used in the present investigation may be somewhat less active than that prepared by Dakin himself. Dr. Dakin suggests¹⁵ as a possibility that when fresh liver is used instead of extract as starting material there may be less "denaturing" and increased activity.

The difficulty in drawing conclusions as to the potency of a product from hæmatological observations in small groups of patients must be fully realised. When reticulocyte counts are made only once daily it is unlikely that the maximum percentage attained will be observed in every instance.⁷ When, as in the present investigation highly purified materials are given and the intramuscular route is used, the irritant effects which may arise from non-specific substances present in material administered intravenously are likely to be less marked. But while we admit that in the majority of cases a maximal reticulocyte rise is followed by an excellent increase in red cells and a poor reticulocyte rise by little or no gain in red blood-cells, a study of Table I. clearly

TABLE III

Comparison of rates of increase of red blood-cells in cases of pernicious anæmia having initial counts of 2 millions per c.mm. or less

Preparation.	Dosage.	Average initial R.B.C.	Average increase in R.B.C.				(a) Average count at 40 days. (b) Time to reach 4 millions
			10 days	20 days	30 days	40 days	
(a) Single Injection							
(i.) D. & W. fraction (B.D.H.): 8 cases.	200 mg. (2 c.cm.)	1.57	0.81	1.36	—	—	—
(ii.) Campolon or Pernæmon Forte: 8 cases (Ungley).	10 c.cm.†	1.37	1.1	2.05	—	—	—
(b) Divided Doses							
(iii.) D. & W. fraction (B.D.H.): 11 cases receiving not more than 600 mg. in 5 weeks.	359 mg. (aver.) in 5 wks.	1.55	0.96	1.54	1.84	2.31	(a) 3.86. (b) 6 wks.
(iv.) Campolon: 12 cases (Davidson).	30 to 82 c.cm. in 5 wks.	1.35	0.78	1.47	2.11	2.46	(a) 3.81
(v.) Liver extract intravenously: 79 cases (Bethell ¹⁴).	10 to 20 c.cm. per wk.	1.3	0.86	1.68	2.42	2.89 + 35 days	(a) 4.19 + 35 days. (b) 5 wks.
(c) Daily Oral Administration.							
(vi.) Ext. 343: 24 cases (Minot, Cohn, Murphy, and Lawson ¹³).	Ext. from 500-600 g. daily.	1.20	0.85	1.90	2.61	—	—
(vii.) Ext. 343: 9 cases (Minot, Cohn, Murphy, and Lawson ¹³).	Ext. from 250 g. + daily.	1.35	0.46	1.25	1.98	—	—

* The figures for R.B.C. increase are approximate, having been calculated from charts in Bethell's paper.
† Containing from 2500 to 3500 mg. of solid matter.
app. = approximate.

campolon in divided doses (Table III., Series i. and iv.) but were less than those which followed the single injection of 10 c.cm. of campolon or pernæmon forte containing from 2500 to 3500 mg. of solid matter* (Table III., Series i. and ii.). The difficulty of assessing the potency of preparations is well exemplified in Table III., Series ii. and iv. The 12 cases in Series iv. received from 20 to 30 c.cm. of campolon during the first week. The average gain in red cells in 20 days is less than that which followed the single injection of 10 c.cm. This cannot be explained as being caused by the effect of a single injection, nor on the grounds of differences in the initial red cell level, but only on fortuitous circumstances by which in series ii. a number of cases happened to be included which show a high grade of response. The average gain in 10 and 20 days in series iv. is of the same magnitude as occurs in series i., iii., and v. The contention that series ii. was fortunate in containing cases showing a high grade of response is supported

* Recent batches of Pernæmon Forte differ from those used in Series ii. in containing a smaller proportion of solid matter.

indicates that exceptions to this rule may occur. Thus while Case 2 showed a good reticulocyte response and little increase in red blood-cells, Case 11 had a poor reticulocyte response followed by a good gain in red blood-cells. In Cases 13 and 14 the patient with the smaller reticulocyte response had a more rapid increase in erythrocytes. A study of Table I. shows marked variations in reticulocyte response and red blood-cell gains in patients at similar initial levels receiving similar amounts of material. These variations may be quite independent of factors such as arterio-sclerosis and infection. This is well exemplified by the differences in reticulocyte response observed in Cases 13 and 14, 15 and 17, 21 and 22, differences for which no adequate explanation is forthcoming. Incidentally although we agree that in general cases with marked arterio-sclerosis or sepsis do badly (see Case 6) this does not hold good in every instance (see Cases 16 B and 13). A striking example of an optimal response in the presence of very severe sepsis has been published by one of us.¹⁶

It might be expected that age would influence the degree of response. Nevertheless analysis of the reticulocyte response and rate of red blood-cell increase in cases receiving Dakin and West's liver fraction showed no difference between those under and over 60 years of age. For this reason, although the age-incidence was higher in eight cases receiving 200 mg. of Dakin and West's liver fraction than in those receiving 10 c.cm. of campolon or pernaemon forte, the fact does not appear to account for the difference in response in the two series.

Since this investigation was commenced Strandell¹⁷ has reported the isolation of an almost colourless liver fraction; 2 mg. dissolved in water and injected intragluteally in patients with pernicious anæmia produced a marked hæmopoietic effect. The method of preparation has not yet been published.

Summary and Conclusions

A total of 36 cases of pernicious anæmia have been treated with Dakin and West's liver fraction, anahæmin. The material has been compared with other liver preparations in respect to the production of reticulocyte responses, increase of red blood-cells, and clinical improvement.

The data submitted emphasise the difficulty of assessing potency upon reticulocyte responses and red blood-cell increase in tests limited to a small number of cases. The results indicate, nevertheless, that anahæmin, as prepared by the British Drug Houses Ltd., is highly active for blood regeneration in pernicious anæmia. Total quantities of 1 to 6 c.cm. (100 to 600 mg., average amount 359 mg.) administered usually in divided doses, to 11 cases with initial red blood-cell counts below 2 millions per c.mm., were sufficient to cause an average increase of erythrocyte concentration amounting to 2.31 millions in 40 days. Good responses followed the administration of amounts sometimes as small as 10 mg. daily or 100-200 mg. as a single dose. For maximal reticulocyte responses, and for the production of red blood-cells at a maximal rate, larger doses were usually required. There is not sufficient data to assess quantitatively the potency of anahæmin as compared with other liver extracts, but in our experience no other liver extract given in the small amounts used in this investigation has produced such striking results. Preliminary observations suggest that this highly purified fraction may prove to be at least as potent as other liver extracts¹⁸

in the treatment of the neurological manifestations of pernicious anæmia.

It is a pleasure to thank members of the staff of the voluntary hospitals in Aberdeen, Sheffield, and Newcastle-upon-Tyne for their kind coöperation, and for allowing us access to their patients. In the case of one of us (C. C. U.) the work has been carried out with the assistance of grants from the Medical Research Council and under the tenure of a Leverhulme research scholarship of the Royal College of Physicians of London.

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NOTE ON THE ANTI-ANÆMIC PRINCIPLE OF LIVER

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MUCH work has been carried out during the last few years in attempts to isolate and elucidate the nature of the principle present in liver that is responsible for initiating remissions in patients with pernicious anæmia. So far the identity of this liver principle remains obscure, although many concentrated highly purified extracts have been prepared. The slow progress has been due partly to the fact that every fraction can only be tested clinically on approved adequately controlled cases of pernicious anæmia,¹ and partly to the nature of the liver principle itself, which is extremely readily destroyed by many solvents and mild reagents—the more highly purified fractions being particularly sensitive.

In consequence of this sensitivity it has been difficult to standardise preparative methods of fractionation that would guarantee hæmopoietically active products every time. However, with the assistance and coöperation of Dr. F. L. Pyman, F.R.S., of the Boots Pure Drug Company Limited, Nottingham, I have been able to make considerable advances in this connexion.

A few months ago Dakin and West² described a method using Reinecke acid whereby they obtained a product of which 80 mg. was capable of producing maximal reticulocyte responses in patients with

pernicious anæmia. This was an important addition to our knowledge of the properties of the liver principle and I therefore attempted to repeat it.

Several difficulties were encountered resulting in the first few experiments yielding inactive products. These having been circumvented, however, successful products can now be prepared satisfactorily and I have been able to confirm Dakin's claim.

All the fractions have been examined clinically by the method already described¹—that is to say, each test case of pernicious anæmia was a typical uncomplicated one in relapse without having had treatment previously to complicate the picture. In every case a control period of 7–21 days was noted and the reticulocytes remained within normal limits. (These data are omitted from the Tables.) In each

and made available to me through Mr. Bacharach of Glaxo Limited; this also has been examined clinically. It will be seen that responses were obtained using doses of 4–8 c.cm. when administered intramuscularly; each cubic centimetre of this solution contained 10 mg. of total solid so that the dosages used were 40–80 mg. (Table II).

TABLE II
Response to Strandell's Extract

Fraction and Case No.	Total dose.	Day of treatment.	Retic. (per cent.).	R.B.C.	Hb. (per cent.).
N.S.G.L. 1 (PA/607).	mg. 80	1	1.0	910,000	27
		4	5.4	952,000	28
		9	33.0	—	—
		11	19.8	1,824,000	46
N.S.G.L. 1 (PA/598).	60	18	2.2	2,280,000	56
		1	2.6	1,680,000	44
		5	3.9	—	—
		7	9.3	1,950,000	50
		8	18.8	—	—
N.S.G.L. 1 (PA/609).	40	14	2.3	2,560,000	62
		1	3.5	1,750,000	54
		5	10.1	—	—
		7	14.9	—	—
		8	7.3	1,910,000	60
		15	1.0	2,670,000	68
		22	1.6	3,360,000	76
27	0.7	3,800,000	78		

TABLE I

Reticulocyte Response to Extracts prepared by Dakin and West's Method

Fraction and Case No.	Total dose.	Equiv. fresh liver.	Day of treatment.	Retic. (per cent.).	R.B.C.	Hb. (per cent.).
W.D. 8 (PA/A/43).	mg. 90	g. 150	1	0.5	990,000	26
			3	0.5	—	—
			6	23.8	—	—
			7	39.8	960,000	26
			12	6.0	1,630,000	39
			19	2.5	2,110,000	42
			1	1.9	1,190,000	40
W.D. 8 (PA/512).	120	200	4	7.0	—	—
			6	39.7	1,610,000	42
			1	1.8	1,310,000	34
W.D. 8 (PA/628).	120	200	5	6.4	—	—
			7	12.0	1,410,000	40
			8	30.0	—	—
			13	4.0	2,210,000	58
			23	0.7	3,500,000	70
W.D. 9 (PA/622).	58	100	1	1.5	1,150,000	28
			4	5.8	—	—
			5	17.2	—	—
			7	40.2	1,480,000	42
			9	25.0	—	—
			14	6.8	2,160,000	54
			21	2.5	2,540,000	64
W.D. 9 (PA/623).	116	200	35	0.5	3,040,000	74
			1	0.6	1,216,000	35
			4	3.4	—	—
			6	36.2	1,304,000	39
			8	20.2	—	—
W.D. 9 (PA/631).	87	150	11	3.6	1,950,000	52
			1	1.4	1,380,000	40
			4	5.4	—	—
			6	24.7	1,020,000	28
			7	31.6	—	—
16	1.9	2,200,000	58			

R.B.C. = red blood-cells. Hb. = hæmoglobin.

case reported in this paper no further subsequent reticulocyte response was obtained after those tabulated, which indicates that they were maximal responses. Table I. shows results from our experimental series W.D. 8 and W.D. 9, selected to illustrate the repetition of Dakin's method. It will be seen that maximal reticulocyte responses have been obtained with doses of 58–120 mg. of these fractions when given intramuscularly. Thus my results confirm the claims of Dakin and West that Reinecke acid can be used further to purify the anti-anæmic liver principle, but a good deal of active material is lost during the various stages of these chemical manipulations.

While these experiments were in progress Strandell³ reported good hæmopoietic responses using specially fractionated liver products (details of which have not yet been published), and claimed maximal responses with doses of only 0.002 g. He kindly sent me some of his unpublished results in connexion with this, and at the same time an experimental quantity of a highly purified liver fraction (N.S.G.L.1) similar to those he had been using was obtained by

Having successfully repeated the Reinecke acid method of fractionation several times, I have now introduced it as a step in our methods of fractionation. This has been done by (1) carrying out the Reinecke acid separation first and then subjecting the product to further fractionation, and (2) by applying the Reinecke acid separation to the products obtained by our own methods. Again these have been carried out on a sufficiently large scale by Dr. Pyman so that adequate supplies have been available for trial.

In series W.D.7, shown in Table III., it will be seen clearly that the potency of the final product

TABLE III
Response to Author's Extract

Fraction and Case No.	Total dose.	Equiv. fresh liver.	Day of treatment.	Retic. (per cent.).	R.B.C.	Hb. (per cent.).
W.D. 7 (PA/512).	mg. 36	g. 1332	1	2.8	1,340,000	36
			4	5.3	—	—
			5	28.8	—	—
			7	40.0	—	—
			11	5.8	2,350,000	52
			18	2.5	2,730,000	57
			1	0.5	1,320,000	36
W.D. 7 (PA/629).	27	999	5	4.0	—	—
			7	29.0	1,850,000	48
			9	20.0	—	—
			14	2.0	2,190,000	58
W.D. 7 (PA/A/51).	18	666	1	1.4	960,000	28
			3	2.5	—	—
			5	12.0	—	—
			7	32.0	1,500,000	34
			14	5.8	2,150,000	40

has been greatly increased, since maximal responses have been obtained consistently with total doses of only 18–36 mg. representing an original amount of 666–1332 g. of fresh liver. The product thus obtained was colourless and was administered in aqueous solution. Further fractionation is in progress and I hope at a later date to report fuller details.

SUMMARY

The fractionation of liver extracts containing the anti-pernicious anæmia principle by means of Reinecke

acid to yield a more highly potent fraction has been confirmed. Using this method products have been obtained of which 58 mg. produced a maximal reticulocyte response and a rapid remission in a patient with pernicious anæmia. Applying this method to other methods of separation a further increase in hæmopoietic potency has been secured so that as little as 18 mg. of the product have been sufficient to initiate a maximal reticulocyte response and rapid remissions in pernicious anæmia.

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THE PROGNOSIS AFTER INFARCT OF THE HEART

A CLINICAL STUDY

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THE dramatic symptoms which sometimes occur when a coronary artery becomes blocked, and the not infrequent sudden termination of life, have led to a pessimistic outlook in these cases. But pathological experience has shown that cardiac infarcts are not necessarily immediately fatal, and that recovery may ensue. In Moritz and Beck's¹ series of 94 cases in which a main coronary artery had been occluded only 14 died after the first block. Accumulating clinical experience points in the same direction. Parkinson and Bedford² state that if the patient is alive when seen after the occurrence of an infarct recovery is more likely than death. Reasonable health may be maintained subsequently even for many years. Cases have been reported where the patient lived for seven,³ eleven,² thirteen,⁴ fourteen,⁵ seventeen,⁶ and twenty⁷ years.

Abrupt closure of a healthy main coronary artery causes sudden death, but if the closure is gradual anastomotic developments may take place in the neighbouring arteries and prevent serious results. Clifford Allbutt⁸ examined a heart where the orifices of the coronary arteries were so utterly obliterated that their very site was indefinable, and yet the myocardium was normal. Leary and Wearn⁹ report a case in which the orifices were almost completely closed and the muscle normal; and another case where the right coronary artery was blocked and the orifice of the left artery greatly narrowed, yet again with normal cardiac muscle. We have examined the heart of a man, aged 73, whose right coronary artery was occluded for about an inch, immediately after its origin, the only result being a small area of ischæmic fibrosis, not due to infarct, near the base of the right ventricle.

As a rule block takes place in a coronary branch and not in a main trunk, and the possibilities of satisfactory anastomotic developments are greater than if a main artery is affected. It seems that infarct is rarely due to closure of a single vessel. Saphir and his colleagues,¹⁰ examining with meticulous care 30 cases of infarct, failed to find a single case in which but one artery was affected. Two might be completely closed, or one blocked and the neigh-

bouring arteries grossly narrowed. Multiple lesions are necessary to produce an infarct.

The size of infarcts varies. They may be large or small. The gross lesions, affecting large areas of the myocardium, were those which first attracted clinical attention, but we are now recognising the lesser lesions. In the gross lesions the early symptoms are severe and persist for some time. In the lesser lesions the early symptoms may be severe but of short duration, or of comparatively mild type. Thoracic pain is not invariably present. Pain may be referred to the abdomen or wholly absent. Sudden cardiac collapse or an attack of dyspnœa may be the only sign of infarct.

The prognosis in cases of cardiac infarct is difficult to assess. Sudden death, without warning, may be the sole clinical sign of a coronary block. In the major attacks half the patients die at the outset, or within the next month. Of those who survive some never regain health, and die of progressive cardiac failure after a variable period. Others regain their health and live, even for many years, in fair comfort. There is little available information regarding the ultimate issue in the last groups, so we have examined the clinical records of 66 patients, 58 men and 8 women, who had had an infarct of the heart and survived for more than six months afterwards. This period was chosen as we are concerned with the late results of infarct, and recovery is rarely definite before six months have elapsed. The records are necessarily incomplete for 33 of the patients are still alive. Forty-four patients have lived for more than two years, one of them for ten and another for fourteen years. Thirty-eight resumed their work, which, however, as one would anticipate from their age, was never manual and could usually be regulated according to their physical needs.

Thirty-three patients are still alive, more than six months after an infarct. One patient whose infarct occurred *nine months* ago has never regained health. He has had several strokes and has uræmic symptoms.

TABLE I

Showing the present health of those patients who are still alive

Duration of life after an infarct.	Health			
	Good.	Fair.	Poor.	Total cases.
Less than one year ..	—	—	1	1
More than one year ..	3	4	1	8
" two years ..	3	1	—	4
" three " ..	4	3	—	8*
" four " ..	2	1	—	3
" five " ..	3	3	2	8
" six " ..	1	—	—	1
—	16	12	4	33

* 1 unknown.

Eight patients have survived for more than *one* year. One of them has recently had a recurrence of cardiac symptoms. Four are in fair health for their years, and lead a quiet life without discomfort. Three are in good health, two in active work. One rides quietly and shoots driven birds. Another is paying visits in the U.S.A. Four have lived for more than *two* years. Three are in good health and lead their usual life, which in one case is very active. The fourth is in fair health, but resents his necessary abstention from golf. Eight have survived for more

than *three* years. Four, in reasonable health, are still at work. One has benefited by removal of gall-stones. Three are in reasonable health but have retired from business. The other is still alive, but as he has left the district his activity is unknown. Three patients have survived for *four* years. Two are leading active lives. The third, who is in fair health, has retired from business. Eight patients are alive *five* years after an infarct. One has had a recurrence of cardiac symptoms recently, and is forced to lead a quiet life. Another has never recovered his health. He has had a stroke, and a foot removed for gangrene; the other foot is now affected. Three are in fair health, leading a quiet life. Three are active in business, two of them playing golf as well as ever, though their standard may not be high. One patient is still alive after *six* years and works hard at his business.

Sixteen of these patients resumed their ordinary occupations after an infarct. Twelve are in fair health. The health of the remaining four is poor.

Thirty-three patients have now died. Seven died *within a year* of the first attack. Five of them never regained tolerable health, but two returned to work, one dying when shaving, the other in his garage. Six patients died in the *second* year. Three never regained tolerable health, but three resumed their ordinary avocations. Five patients died in the *third* year. One was never well and died from uræmia. The other four resumed their usual habits, two of them undertaking arduous work. Three died in the *fourth* year. Two were never really well. The third continued at work until the onset of a pulmonary tumour. Three died in the *fifth* year. All resumed their work. One died without warning in his sleep, one from a stroke, the third from pneumonia. Four died in the *sixth* year. All resumed their work. One patient died in the *seventh* year, having continued at work fairly steadily in the interval. He died in the bathroom within a few minutes. One died in the *eighth* year, after nearly five years of strenuous work. One died in the *ninth* year. He worked hard for many years and played golf. He died in his sleep some months after a successful operation for gall-stones. One patient lived for *ten* years after his first attack, and for five after the second. A third attack proved fatal. One patient recovered from his first attack and worked hard for the next five years, subsequently taking life easily. He had a slight recurrence of cardiac symptoms nine years after the first. He died slowly from cerebral softening *fourteen* years after the initial symptoms.

Twenty-two of these patients resumed their ordinary avocations for a time after an infarct. In at least ten cases the work was arduous. Several played golf, shot, climbed hills, &c., without difficulty.

Patients who have had a cardiac infarct do not always die from cardiac failure. In Parkinson and Bedford's² series 21 of 83 cases, examined post mortem, died from other than cardiac causes. In this series 24 patients died from cardiac failure, 14 slowly and 10 suddenly. But 2 patients died from strokes; 2 from embolism, of a cerebral and of a femoral artery; 2 from tumour; 1 from pneumonia; 1 from senile decay. The cause of death of the other patient could not be ascertained.

The occurrence of a cardiac infarct may be merely a phase of a general disease. One patient had a stroke in 1921, a cardiac infarct in 1922, and a second, fatal, stroke in 1925. He had no cardiac

symptoms save at the time of the infarct. A lady complained of intermittent claudication in 1930, had a cardiac infarct in 1931, a right hemianopia in 1932, and a second, fatal, cardiac infarct in 1933. Another patient, who is still alive, has never been well since his infarct in 1932. He has had a stroke, and one foot had to be amputated on account of senile gangrene in 1934. The other foot is now affected.

In some patients disease in organs other than the heart complicates the picture and the outlook. One patient suffered from cholecystitis in the spring of 1930 and from a cardiac infarct in the autumn; in 1931 from jaundice; in 1932 from cardiac, hepatic, and cerebral symptoms, the latter probably due to embolism; in 1933 and 1934 from recurrences of his hepatic symptoms, which necessitated the removal of gall-stones in July, 1934; in January, 1935, from convulsions. He is now in better health than for many years, and active at business. Gall-stones are not uncommon in this group of cardiac disease. Operative interference is, as a rule, badly borne, but we have seen several patients who were benefited. Renal and diabetic symptoms may coincide, and occasionally dominate the outlook. One patient, who is not included in this series, was admitted into hospital on account of uræmic symptoms of some months' duration. He died in coma. Post-mortem examination revealed cirrhotic kidneys and a greatly enlarged heart, with aneurysm of the anterior wall of the left ventricle. Three weeks before his death his systolic blood pressure was 160 mm. Hg. There was a minimal œdema of his feet on admission, but it soon disappeared and did not recur, so the sole evidence of cardiac insufficiency lay in the presence of symptoms of renal inadequacy.

In the presence of symptoms of cardiac insufficiency the prognosis must be based upon the symptoms as they emerge, day by day, as in cases of cardiac weakness due to other causes. In cases where recovery has ensued after a cardiac infarct the prognosis must be based upon all the data that are procurable, always remembering that sudden death is not uncommon in these patients and may occur without warning. An old gentleman, who had had a cardiac infarct five years previously from which he had made a good recovery, completed his usual day's work, took his dogs for an airing, and went to bed, where he was found lying dead in the morning. Another patient, whose infarct had occurred eight years previously, who had had gall-stones removed some months before, was met casually one afternoon. He told us that he was very well and resuming his work gradually. After dinner he played a game of cards and went to bed. He died in his sleep.

In this series nine patients are alive more than six and less than twenty-four months after an infarct. Two are active at work and straining at the leash; five are in fair, and two in poor, health. As the issue in this group is still uncertain we have omitted them from our figures. Prolongation of life for two years or more seems to indicate that the original lesion has healed, and that danger lies in the underlying pathological state rather than in the past infarct; in the possibility of the occurrence of a fresh lesion rather than from progressive changes in the ancient one. Thirteen patients died within the first two years; 44 have lived for more than two years. A comparison of the data in these two groups is shown below in the attempt to estimate the favourable and the unfavourable factors as regards continuance of life.

Age of the patient.—The younger patients have the better outlook. Levine's experience¹¹ agrees. But the prognosis is not good in the syphilitic group, with aortic incompetence and narrowing of the coronary orifices, whose symptoms tend to arise in the fourth and fifth decades. The more ample anastomoses of the coronary arteries, which normally develop as age increases, are evidently unable to cope with the extra work which a coronary block imposes upon the neighbouring arteries.

TABLE II

Data derived from the examination of 57 patients, at a variable period, after the occurrence of a cardiac infarct. Forty-four patients lived for more than two years afterwards; 13 died within two years.

	Duration of life.			Duration of life.	
	More than 2 yrs.	Less than 2 yrs.		More than 2 yrs.	Less than 2 yrs.
Age—					
40-49	3	—	Blood pressure—		
50-59	16	3	Above 150	24	11
60-69	19	8	" " mm. Hg	20	2
70-79	6	2	below		
Previous health of patient was—			Electrocardiograms: 50 cases—		
Good	23	6	No appreciable abnormality ..	6	1
Poor	21	7	Some ditto ..	32	11
Anginal attacks before infarct—			T ₁ inverted ..	12	3
Had occurred ..	14	4	T ₂	12	5
Had not occurred	30	9	T ₃	—	1
Onset—			Bundle-branch block: Type I..	5	1
Sudden	35	10	Heart-block (temporary) ..	1	—
Gradual	9	3	Auricular fibrillation	1	—
Initial attack—			Dissociation	—	1
Severe	24	10	Retinal arteries—		
Moderate	20	3	Degenerate ..	10	2
Heart—			Normal	34	11
Enlarged	24	10	Aortic diastolic murmur ..	—	2
Not enlarged ..	20	3	Syphilis (?)	5	2

Previous health of the patient.—There is little difference in the data of the two groups. The result evidently depends more upon the extent of the local lesion than upon the general health of the patient, though any deterioration of the general health must react unfavourably upon the process of healing.

The occurrence of attacks of angina pectoris prior to the infarct does not seem to affect the ultimate result. Carey Coombs¹² and White and Bland¹³ agree. One could conceive that the occurrence of coronary narrowing in the past would facilitate the anastomotic developments required when an artery becomes blocked. The continuance of anginous attacks, however, predicates that anastomotic developments have not been effective. Saphir's observations,¹⁰ too, show that infarct is a matter of multiple arterial lesions; and any damage to one part of the myocardium must necessarily augment the strain upon the rest of the cardiac muscle.

Mode of onset of the illness.—In some cases an infarct occurs in a man whose health was apparently perfect. In others minor symptoms have preceded the occurrence of the infarct. The results in the two groups seem similar.

Severity of the initial symptoms.—If the doctor in attendance at the time of the initial attack thought that the patient was dying the case has been indexed as severe. The results in those patients whose initial symptoms were severe are less favourable than those in the second group. The difference probably depends upon differences in the extent of the area which is affected, or upon the rapidity of the development of the cardiac ischaemia.

Physical data.—*Enlargement of the heart* is of evil significance, whether due to hypertrophy or to dilatation. The former indicates pre-existing strain upon the heart; the latter a failure of the surviving muscle to compensate the loss of some muscle cells. *A high blood pressure* is unfavourable. It must be borne in mind that we are now considering the state of affairs some time subsequent to an infarction. In the early days a low blood pressure is an unfavourable sign as Harrington and Wright¹⁴ and Hay⁴ state, for it is an indication of myocardial failure. A lessening pulse pressure is particularly ominous. But when convalescence has been attained the case is different. A normal blood pressure suggests that the cardiovascular system is fairly sound, while a high blood pressure suggests the opposite conclusion, and in any case throws a heavy strain upon a damaged myocardium. The large number of patients with *normal retinal arteries* corroborates the idea that coronary block is most frequently a matter of local arterial disease—i.e., atheroma—rather than due to the diffuse affection, arterio-sclerosis. It is impossible to assess the influence of *chronic valvular disease* in a clinical series as the significance of a systolic murmur is often obscure. No case of mitral stenosis is included. There were two cases of aortic incompetence. One patient was aged 76, and generally degenerate, with Cheyne-Stokes breathing, pulmonary infarctions, and copious albuminuria. The lesion in the other patient was possibly syphilitic. He was aged 63; dissociation was present at one time. The first patient died seven months after the infarct; the second lived for nearly a year and a half. *Electrocardiograms* were taken in 50 cases in this series and showed various abnormalities. The records are too scanty to afford useful information as to the relative importance of the different defects, but a normal record is evidently a favourable sign. Inversion of T in all leads and flatness of all T's are unfavourable.

The occurrence of an attack of *syphilis* in the past does not necessarily prove that the cause of the cardiac infarct is syphilitic. Seven patients in this series had probably suffered from syphilis. The duration of life in these patients seems to be little influenced by this factor.

The prognosis after the occurrence of a cardiac infarct is better: among the younger patients; if the initial attack has been moderate in its severity; if the blood pressure is not unduly high; if the heart is not appreciably enlarged; and if the electrocardiogram is normal in character.

Two other factors are important elements in the prognosis: the care that is taken at the time of the infarct, and the reaction of the sufferer to his disability.

"Cure" of an infarct depends upon the development of satisfactory arterial anastomoses around the lesion. The possibilities are considerable but their development is slow. Strain upon muscle cells so long as they are inadequately nourished must be avoided. Our best results have been attained by keeping our patients at absolute rest for a couple of months, permitting a very gradual resumption of physical activities during the next two months, and then a very gradual return to the ordinary habits of life. Success, too, depends largely upon the coöperation of the patient. The well-balanced individual, of good physique and firm muscle, accepts the situation and does his best to aid. The irritable podgy fellow, flabby of brain and muscle, resents the necessary restrictions and cramps the cure. Social and business

commitments may occasion difficulties, but they can be surmounted when the patient realises the nature of his illness, and the nature of the cure. All can recall unfortunate results of a too early return to ordinary activities.

The occurrence of a cardiac infarct occasions grave danger to life, but if the patient survives the onset satisfactorily he has a fair chance of reasonable health even for many years.

We must acknowledge, with grateful thanks, the kindly help of our colleagues who have supplied us with many of the data on which this paper is based.

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SOME OBSERVATIONS ON EXPERIMENTAL RENAL SECTION

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THE effect of hemisection of the kidney is still a matter of dispute. With increasing accuracy of diagnosis the indications for this operation in man have become very few, but there may still be occasional cases in which, despite all investigation, uncertainty exists, and such an exploration might be desirable. The question arises whether it is justifiable, and I felt that it would be of interest to study experimentally the effects of the operation upon (a) the incised kidney and (b) the remaining normal kidney.

INVESTIGATION

Twelve bitches were subjected to a preliminary cystoscopy in the course of which 5 c.cm. of 0.4 per cent. indigo-carmin was injected intravenously and the ureteric efflux from each side noted. (This method of investigating the renal function was chosen because it was found to be the most practicable. It had originally been hoped to catheterise the ureters and collect specimens from each side, but this proved too difficult to perform with certainty.) After a few days' interval the kidney on one side was divided completely from pole to pole until the pelvis was laid open. In order to control the hæmorrhage, a Crile's clamp was placed on the renal pedicle before the incision was made. The two halves were then brought together by two or three mattress sutures (catgut No. 2) passing through the parenchyma, three being usually required. The operation was completed with all speed, seldom occupying more than five minutes and never more than ten, in order to avoid the effects of prolonged anoxæmia. (A clamp on the pedicle would be used in clinical practice, and it was felt that the experimental operation should approximate as closely as possible in all details,

although otherwise it might have been better to avoid it.) After removing the clamp any further oozing was controlled by pressure with a hot gauze. The renal capsule was sewn up separately, the kidney replaced, and the wound closed. This was the operation performed on the first 6 dogs. The second 6 dogs had an identical operation except that the halves of the kidney were brought together by the use of Lowsley's ribbon catgut inserted, in the way he describes, through the capsule and carried round the kidney. By this method the objection that strangulation of tissue, including blood-vessels, would occur is eliminated, and so this operation should be the better one to perform. This investigation was undertaken partly, therefore, to compare the results of the two methods.

After the operation the animals were cystoscoped as far as possible at monthly intervals, using exactly the same technique with regard to anæsthesia and dose of dye as on the first occasion. Particular attention was paid to the time of appearance and concentration of the drug at each ureteric orifice.

At the end of three months the animals were anæsthetised with Luminal, laparotomy was performed, and catheters were passed into the ureters. Phenolsulphone-phthalein (1 c.cm.) was given intravenously and specimens collected from both kidneys. In practice it was found necessary to give 250 c.cm. of saline intravenously to promote diuresis or no specimens could be obtained. This, while interfering with any determination of total renal function, would not invalidate a comparison of that of the two sides, which was here required.

RESULTS

Table I. gives details of the operation and results; Table II., and the ensuing text, summarises them. It will be seen that 4 dogs died. One of these (No. 39) was suffering from other conditions which may have been partly responsible for death, but in any case the kidney was completely destroyed so that from the point of view of this operation it represents a failure. One other had complete atrophy, so that 7 survived with functioning kidneys. Of these 7, 5 had changes of greater or lesser degree but did not show progressive impairment or degeneration during the period of observation.

Renal Function.—The results obtained may be summarised as follows:—

(a) *Injured kidney.*—Eight showed marked impairment in one or other test. (See Table I., Nos. 15, 17, 20, 30, 35, 36, 37, and 39.) Three showed slight impairment in one or other test (Nos. 16, 19, and 29).

(b) *Sound kidney.*—Eight showed increased function (Nos. 15, 16, 19, 20, 29, 30, 37, and 39).

The most interesting feature was the apparent increase of concentration in the indigo-carmin excreted by the sound kidney; although given under identical conditions the dye was excreted in a shorter time and stronger concentration than before the operation. Along with this there was usually evidence of impairment in the operated kidney, so the conclusion can hardly be avoided that the sound one was doing more work because of the injury to the other.

Pyelography.—It will be seen from Table I. that—

Six showed marked deformity of the pelvis on the operated side (Nos. 15, 16, 17, 20, 29, and 30).

Two showed slight deformity of the pelvis on the operated side (Nos. 19 and 35).

Four were not investigated. The two cases of hydro-nephrosis fall into this latter group.

TABLE I.—OPERATIONS AND RESULTS

Dog.	Operation.	Cystoscopy. Time of appearance of dye (minutes).		Pycelography.		P.S.P.	Result.	Post-mortem and histological examination.
		Before Op.	After Op.	Intravenous.	Retro- grade.			
15	Mar. 9, 1934. Lt. side, 3 mattress sutures.	Rt. 6 Lt. 4.	(1) Rt. (conc.) 2½. Lt. 7. (2) Rt. (conc.) 2½. Lt. 5.	Rt. visualised. Lt. not visualised.	No abnor- mality detected.	—	Died June 20.	Lt. kidney shows area of destruction of tubules particularly in cortex. Prussian blue injected into aorta demonstrates rt. vessels well filled. Lt. side not well filled and avascular areas related to the scarred tissue.
16	Mar. 15, 1934. Rt. side, 3 mattress sutures.	Rt. 3½. Lt. 4½.	Rt. 4½. Lt. (conc.) 4.	—	Rt. pelvis abnormal in contour.	Rt. 20%. Lt. 25%.	Killed June 27.	Rt. kidney deformed (Fig. 1). Section shows areas of scarring in cortex and medulla with destruction of blood-supply as demonstrated by injection of carmine-gelatin.
17	Apr. 3, 1934. Rt., 3 sutures.	Failure.	Failure.	Rt. small pelvis not visualised well suggests poor function. Lt. pelvis visualised well.	Alt. in size and shape of rt. pelvis (Fig. 2).	Rt. 20%. Lt. 30%.	Killed Sept. 4.	Rt. kidney atrophied less than half the size of left. Section shows areas of destruction of tubules with deficient blood-supply in these areas as demonstrated by injection of carmine-gelatin into aorta (Fig. 3). Vessels in lt. also better filled than in rt.
18	Mar. 19, 1934. Rt., 3 sutures.	Rt. 6. Lt. not seen.	—	—	—	—	Died Mar. 25.	Rt. kidney complete hydronephrotic shell and full of blood (Fig. 4). Section: hydronephrosis and hæmorrhage.
19	Mar. 27, 1934. Lt., 3 sutures.	Rt. 8. Lt. 6.	(1) Rt. 5. Lt. 7. (2) (conc.) Rt. 4. Lt. 7. (3) (conc.) Rt. 4. Lt. 7.	Lt. pelvis ureter visualised clearly even better than right.	Lt. pelvis shows some abnor- mality of contour.	—	Killed Sept. 14.	Lt. kidney much smaller than rt. and softer in consistency but otherwise looks normal. On section there is marked destruction of tubules in the cortex, scarcely any normal tissue being left.
20	Apr. 9, 1934. Lt., 3 sutures.	Both 4.	(1) Rt. (conc.) 3½. Lt. 4. (2) Rt. (conc.) 1. Lt. 5.	Rt. pelvis well visualised. Lt. not seen.	Some abnor- mality at upper calyces.	Rt. 60%. Lt. 35%.	Killed Sept. 18.	Lt. kidney shows destruction of tubules at upper pole. Blood-supply (carmine-gelatin) deficient here. Blood-vessels on rt. side well filled; better than on lt. (Fig. 5).
29	Dec. 20, 1934. Rt., Lowsley's technique.	Both 14.	(1) Rt. 12. Lt. 7. (2) Rt. nil. Lt. (conc.) 10.	—	Rt. pelvis deformed.	Both 15%.	Killed Mar. 21, 1935.	Rt. kidney small, scarred, and adherent to liver section. Destruction of cortex and pyelitis.
37	Jan. 22, 1935. Rt., Lowsley's technique.	Both 12.	Rt. 20. Lt. (conc.) 5.	—	—	—	Died May 6.	Lumbar sinus present and palpable lump in kidney region. P.M. Rt. pyonephrosis.
30	Dec. 28, 1934. Lt., Lowsley's technique.	Both 2½.	Rt. (conc.) 2½. Lt. nil.	—	Lt. hydro- nephrosis.	—	Killed Mar. 28, 1935.	Lt. kidney small. Section shows areas of dilatation of tubules as in hydro-nephrosis and some areas of fibrosis and some pyelitis.
35	Jan. 15, 1935. Rt., Lowsley's technique.	Both 15.	—	—	No definite abnor- mality.	Rt. 5 and delayed. Lt. 35 imme- diate.	Killed. Apr. 23.	Rt. kidney half size of lt., scarred and adherent to liver but on section there is plenty of normal looking tissue left.
36	Jan. 15, 1935. Lt., Lowsley's technique.	Failure.	Failure.	—	—	Rt. 10. Lt. nil.	Killed May 2.	Lt. kidney small, scarred, and section shows extensive destruction of tubules with deficient blood-supply as demonstrated by Berlin blue injection into aorta.
39	Jan. 29, 1935. Rt., Lowsley's technique.	Both 17.	Rt. nil. Lt. (conc.) 3.	—	—	—	Died May 9.	Rt. kidney almost complete destruction of cortex with a marked calcium deposit. Pyelitis present.

P.S.P. = phenolsulphone-phthalein.

TABLE II.—SUMMARY OF RESULTS

Animal.	Technique.		Hydro- or pyo- nephrosis.	Com- plete atrophy.	Marked diminution in size, obvious deformity.	Slight changes only.
	Mattress sutures.	Lows- ley's.				
15	+	—	—	—	—	+
16	+	—	—	—	—	+
17	+	—	—	+	—	—
18	+	—	+	—	—	—
19	+	—	—	—	+	—
20	+	—	—	—	—	+
29	—	+	—	—	+	—
30	—	+	—	—	+	—
35	—	+	—	—	+	—
36	—	+	—	—	+	—
37	—	+	+	—	—	—
39	—	+	—	+	—	—
..	6	6	2	2	6	2

Two had hydronephrosis; 2 complete atrophy; 6 marked diminution in size and deformity to the naked eye; 2 changes slight.

As a matter of interest it may be worth recording that one other dog developed renal calculi. This animal had had a preliminary nephrectomy and then, after an interval, hemisection of the remaining kidney. At cystoscopy a month later this kidney excreted a concentrated dye, but after another month the animal suddenly died. Post mortem the kidney, though small, looked otherwise normal, but on opening it many calculi were found in the pelvis.

Histological Examination.—The general findings were areas of tubular destruction, most conspicuous in the cortex. These were probably related to areas of deficient blood-supply. In order to investigate this point carmine-gelatin was injected into the aorta while the animals were still alive, since it was felt that this method would not give results

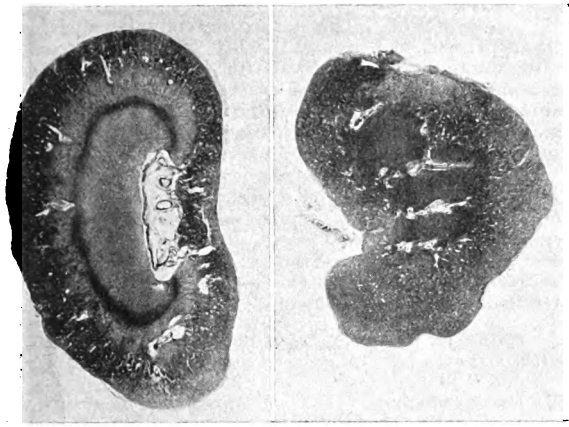


FIG. 1.—Kidneys of Dog 16 showing partial atrophy of right kidney.

of much significance after the circulation had stopped. The carmine was blown in under constant pressure and then the circulation released as quickly as possible before the animal died. Four rabbits treated in the same way (hemisection of kidneys) were given injections of intravital trypan-blue several days prior to the carmine injection, and in this way a combined picture of the tubular function and the blood-supply was obtained. These sections show an intense blue in the tubules of the sound side, whereas on the operated side there is considerable deficiency of blue in the tubules where these are damaged, and here the carmine shows defective blood-supply. These appearances are interpreted as meaning that the function of the sound kidney has increased to counter-balance the damage done to the other side.

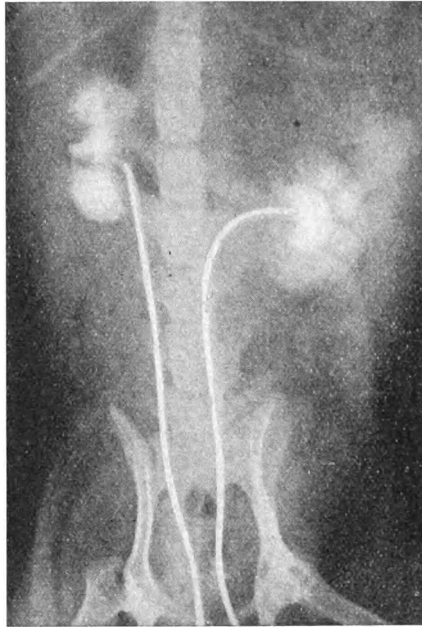


FIG. 2 (Dog 17).—Retrograde pyelogram showing partial atrophy of right kidney.

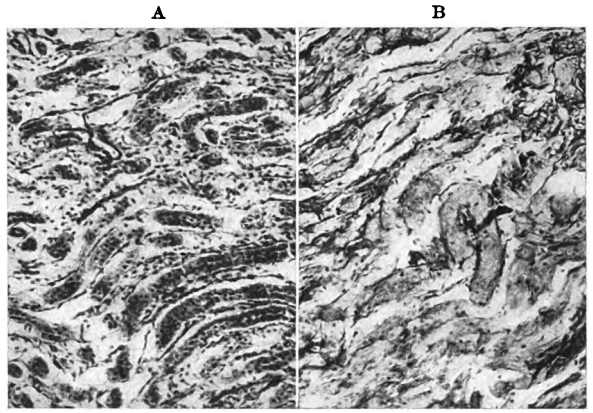


FIG. 3 (Dog 17).—Destruction of tubules on right side (B); hypertrophy of tubules on left (A).

SUMMARY AND CONCLUSIONS

Among 12 dogs on which hemisection of a kidney was performed there were 4 deaths; and 1 other animal showed atrophy of the kidney. Of the remaining 7, 2 can be passed as normal, while 5 had greater or lesser degrees of injury. Observation over three months suggested that the damage was not progressive, although the sound kidney was doing extra work.

It seems clear from this investigation that in assessing the anatomical and physiological condition of the kidneys too much reliance should not be placed on the usual tests of renal function as carried out clinically. Conclusions must be based for the most part on the naked-eye, and to a less extent the microscopic, appearance of the kidneys. In considering the question whether hemisection is

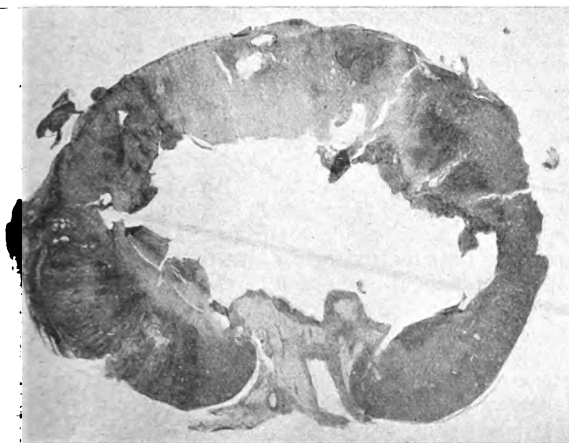


FIG. 4 (Dog 18).—Hydronephrosis of right kidney.

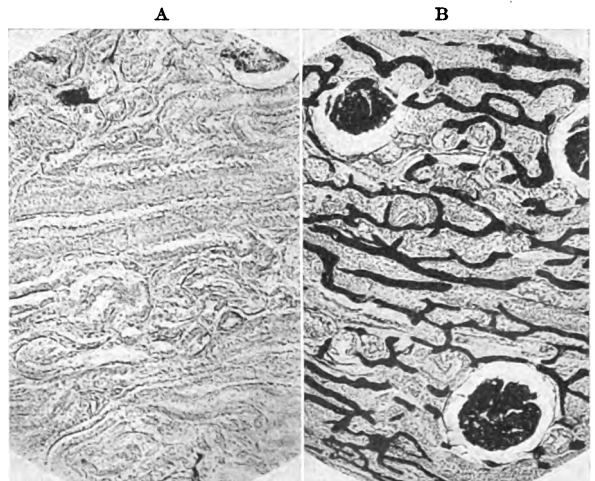


FIG. 5 (Dog 20).—Carmine-gelatin injection five months after operation. Increased blood-supply in right kidney (B); decreased blood-supply in left.

worth while, it must be remembered that it falls into the category of exploratory operations. A sine qua non of such an operation is that it shall do little harm to the organ explored, and hemisection receives no justification from experiments in which the kidney was severely damaged in 4 cases out of 12 cases, and largely atrophied in another.

Nor does it seem that Lowsley's technique is noticeably less deleterious in its effects than the ordinary operation in which mattress sutures are used.

I am indebted to Dr. F. T. Ranson for suggesting the investigation, to Mr. R. V. Dent for the photographs, and to Mr. Henderson for the sections, and to Messrs. Davis and Geck Inc. for a supply of ribbon catgut.

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Clinical and Laboratory Notes

PERFORATED GASTRIC ULCER

RECOVERY IN A MAN AGED 81

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RECOVERY after perforated gastric or duodenal ulcer appears to be rare in the aged. Schulein¹ describes two cases in which a man and a woman, both aged 76, died after operation. Speck² records one case of a woman aged 69 who survived for eight weeks after operation and then died of heart failure; he also gives statistics of eight others all over the age of 60, but does not mention their fate. Graves³ describing eight cases between the ages of 60 and 70 had a recovery in three of them; while Gilmour and Saint,⁴ in a series of sixty-four cases, give the age of five as over 60, the oldest male being 67 and the oldest female 69; only three of the sixty-four failed to recover. Read,⁵ Brown,⁶ and Scotson⁷ also give statistics of perforation in patients over the age of 60, but they do not give information about the fate of individual patients.

The case I describe seems worthy of record in view of the patient's age and his uninterrupted recovery.

On admission to the Archway Hospital the patient gave a history of dyspepsia for the past two years, but he had been comparatively well until the morning of his admission to hospital, when he had suddenly collapsed with severe abdominal pain while engaged in sweeping out his room; he had not vomited. He was an elderly man with severe arterio-sclerosis. The pulse-rate was 116 and the temperature 99.2° F.; although obviously in considerable pain he was not severely collapsed and was able to give a clear account of himself. The abdomen moved very little with respiration; it was rigid throughout, and there was no liver dullness.

The operation under general anaesthesia was begun nine hours after perforation. The peritoneal cavity was found to contain gas and free fluid, and there was a perforation in the anterior surface of the stomach near the pylorus. This was closed with interrupted stitches and reinforced with a piece of adjacent omentum. The

pouch of Douglas was drained by a tube through a supra-pubic stab wound. The patient's convalescence was uneventful and the wound healed by first intention. On discharge home 25 days after operation the scar was sound and the patient walked well. When seen again six months later he stated that he had rapidly gained strength; he now looked after himself and frequently walked 3-5 miles daily; he had no dyspepsia or inconvenience and eats a light mixed diet.

The radiologist's report on a barium meal reads: "The stomach showed normal appearance except for some irregularity on its lesser curve near the pylorus. The latter functioned well, and on pressure the duodenal cap could be well filled; no ulcer crater could be demonstrated either in the stomach or the duodenum."

A reference to the records of Somerset House confirms the age of the patient as 81.

My thanks are due to Dr. C. D. Agassiz, medical superintendent of the hospital, for permission to publish this case, and to Dr. F. G. Nicholas for his report on the barium meal.

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POLYSEROSITIS

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THE subject of polyserositis is complicated by the confusion and complexity of nomenclature; several conditions clinically similar are included under the same title. The term seems most suitable to describe a chronic hyperplastic serositis of the pleural, peritoneal, and, sometimes, pericardial cavities. Some of the synonyms are multiple serositis, Concato's disease, Pick's disease (pericarditic pseudocirrhosis of the liver), diffuse chronic hyperplastic perihepatitis, chronic hyaline perihepatitis, chronic proliferative peritonitis, and Zuckergussleber of Curschmann.

Adherent pericarditis of known aetiology may end with heart failure, chronic venous congestion of the liver, oedema of the lungs, pleural effusion, and ascites, and yet be known by any of the above names, particularly Pick's disease. It does not, however, show the widespread, uniform picture of serous hyperplasia and polyserositis described below, though it is not unusual to find sugar-icing of the liver, peritoneum, and pleura in a minor degree. Chronic nephritis, particularly if associated with arterio-sclerosis or alcoholism, may cause or be associated with Zucker-gussleber, and pearly spots on the pericardium; but the fibrosis never approximates to that met with in polyserositis.

Polyserositis appears to be distinct from "adherent pericarditis" of rheumatic, tuberculous, or pyogenic origin. Its association with chronic nephritis or alcoholism may be fortuitous or causative, the aetiology of both being unknown. In the case described this association was absent.

Polyserositis is an essentially chronic disorder of the middle and later periods of life, whereas pericarditis is usually seen in young people. The symptoms are insidious—namely: (1) Abdominal

pain, due to involvement of peritoneum. (2) Recurrent effusions into serous cavities, requiring more frequent tapping than those of simple cirrhosis of the liver or less virulent forms of pleurisy. (3) Obstruction of the great veins of the trunk with œdema of the limbs. Despite these symptoms the patient's condition may remain good for as long as five or ten years. (4) There is also apparent glandular enlargement in axillæ and groins, due to embedding of lymphatic nodes in active fibrosis of connective tissue.

Radiography may help in deciding that the heart is fixed, the normal movement being replaced by an up-and-down motion; the cardiac enlargement distinctive of pericarditis may be absent in polyserositis. The electrocardiogram may show fixation of axis, due to partial or complete immobilisation of the heart.

The fluid obtained from the pleural cavities is usually clear, yellow, cell-free, and sterile, and contains 3 per cent. of albumin; the ascitic fluid has occasionally been described as chylous.

The fibrosis may be greater on the right side of the body, possibly because there are more lymphatic channels through the right cupola of the diaphragm than through the left. Death results from slow constriction of lungs, heart, and great vessels.

CASE-HISTORY

In 1929 a man, aged 38, sustained an "injury" to the sacro-iliac region while at work. There were no radiographic signs, but he was thenceforward unable to work and was given weekly compensation. In November, 1933, he was in hospital with pain in back; "loss of use" and swelling of legs; cough, six months; sense of constriction in throat. He discharged himself after three days, but in December, 1933, was admitted to another hospital.

Complaint: pain right chest and pit of stomach, especially after food; dyspnoea; swelling of legs; cough.

Physical state: cyanosis; distended chest veins; solid middle and lower lobes right lung; right clear pleural effusion; fixed, firm glands in axillæ and femoral triangles; much frothy sputum; heart displaced to left; pulse-rate 120; afebrile; ascites absent; tender liver; Wassermann reaction negative; no anæmia; 13,600 total leucocytes per c.mm., 11,600 (84 per cent.) being neutrophils; X ray? neoplasm right lung.

Diagnosis: neoplasm right lung.

After discharge the right pleura was tapped every two or three weeks. Accidental pneumothorax occurred once and appeared to give relief and postpone the next tapping.

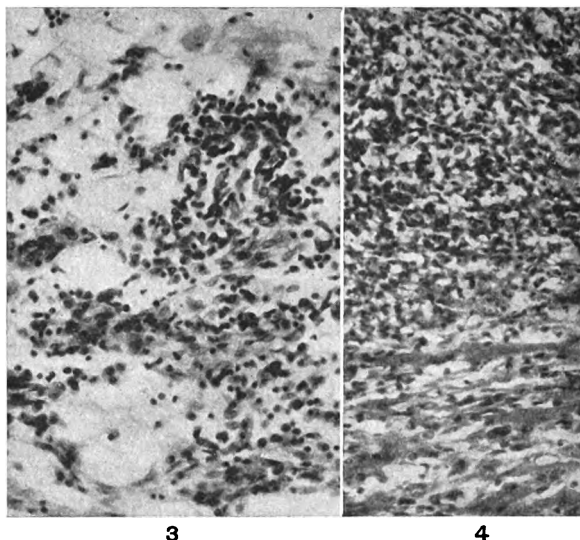


FIG. 3.—Subpleural fatty connective tissue; vascularised and permeated by lymphoid and plasma cells. ($\times 200$.)

FIG. 4.—Hepatic peritoneum. Portion of acute inflammatory focus; polynuclear leucocytes numerous. ($\times 200$.)

There was increase of hepatic pain and tenderness, with œdema of adjacent anterior abdominal wall; more frequent acute epigastric pain and vomiting, only relieved by morphia, and slight ascites. In October, 1934, he was readmitted to hospital. There was loss of weight; tense abdomen, with slight ascites; slight pleural effusion and pneumothorax; 70 per cent. hæmoglobin, 9200 neutrophils per c.mm.; liver enlarged downwards and tender; signs of cardiac hypertrophy and dilatation absent. An inguinal gland was excised for examination. The patient discharged himself after one week, and in November, 1934, at the age of 43, he died by sudden failure of right side of heart.

NECROPSY

General.—Pale; moderate wasting; upper abdomen prominent and tense; chest assymetrical, left side more prominent anteriorly than right; varicose distension of superficial veins of neck and upper half of chest; diffuse swellings, apparently glandular, in both groins and both axillæ.

Thorax.—Back of sternum only detached from pericardium and mediastinum by cutting dense, white, rather elastic tissue, which spreads laterally over anterior borders and surfaces of both lungs. Large, slightly hæmorrhagic pleural effusions (bilateral). Left lung compressed by pleural effusion; substance œdematous and congested; lung free except on medial aspect, where the pleura fuses with general mediastinal mass of dense, white tissue; lateral and posterior left pleura normal. Right pleural sac partly obliterated by loculi of yellow, gelatinous exudate; right lung much collapsed, encased in dense coat of "sugar ice," with pitted surface, and 2 to 7 mm. thick; upper lobe removed by incision through large areas of fusion of visceral and parietal pleura; right parietal pleura, where free, is 5 to 8 mm. thick; this sclerosis penetrates upper intercostal spaces on both sides, infiltrates the axillary spaces and embeds groups of lymphatic glands of normal appearance; sclerosis lacks defined limits and resembles mediastinal tissue. Anterior part of pericardium thick and adherent to back of sternum and anterior surface of heart. Heart distorted by antero-posterior compression, showing atrophy of muscle and marked dilatation of right side.

Abdomen.—White, dense sclerosis covers both surfaces of both sides of the diaphragm, upper surface of liver, left perirenal tissue, and whole of prevertebral tissue, so that a solid mass embeds aorta, inferior vena cava, duodenum, and pelvic portions of ileum and colon. In front of the spine this mass is 20 to 30 mm. thick. Lower border of liver is at level of umbilicus; left lobe adherent to anterior

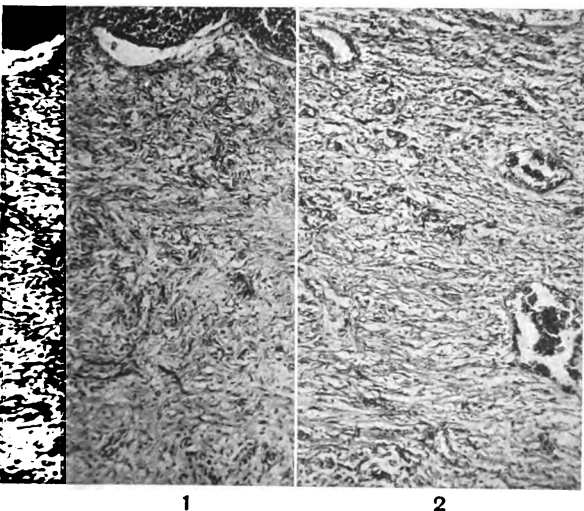


FIG. 1.—Fibrosis encroaching on inguinal gland. Very cellular, vascular, and of active growth. ($\times 100$.)

FIG. 2.—Pleura. Features similar to Fig. 1. ($\times 100$.)

abdominal wall; liver weighs 1.9 kg. (plus 20 per cent.). Spleen adherent to stomach and diaphragm. Sclerosis involves both iliac sets of main vessels, penetrates to the femoral triangles where lymphatic glands are embedded, as in axillae. Lateral peritoneum of the pelvis is very thick, burying the nerve-roots to the lower limbs. Skull and spinal column, central nervous system, and remaining viscera normal.

Microscopical.—Rather than hyaline lamination, the features of the fibrosis are cellularity, vascularity, and active growth, suggesting active infection, though micro-organisms could not be demonstrated in sections. The penetration of the fibrosis to the axillary and inguinal spaces appears unrecorded in the literature.

Polyserositis should be considered, therefore, in the presence of any or all of the following symptoms: mediastinal or abdominal venous obstruction, recurrent effusion into serous cavities, adherent pericardium, and enlargement of the liver—even if these are associated with apparent glandular enlargement. In the case described the pericardial lesion was an embedding of the heart and great vessels rather than adhesion between the parietal and visceral pericardium. Thus it follows that polyserositis should be considered as an alternative diagnosis to mediastinal neoplasm, Hodgkin's disease, adherent pericarditis, and cirrhosis of the liver.

We wish to thank Dr. A. E. Rayner for his permission to record this case which was under his charge, and Mr. H. C. Taylor for the photomicrographs.

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HISTAMINE IONISATION IN RHEUMATISM AND ALLIED CONDITIONS

ANALYSIS OF ONE HUNDRED CASES

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ALTHOUGH the series of consecutive cases reviewed here is somewhat short, an analysis of the results may be of value in showing how histamine can be used in the routine treatment of rheumatism. The total number of applications was 2496—an average of 25 per patient—and it was usually found that at least 12 were required for any permanent improvement. Apart from an insignificant number who were found to be constitutionally unsuited for balneological treatment, all the patients received concurrently some form of brine bath, and often massage in addition.

The method of treatment employed is essentially the same as that already described,¹ with the notable addition of a preliminary preparation of the area with multiple punctures and scratches produced by a special scarifier. This procedure is based on that recommended by Vas,² and is now finally considered beneficial. In most cases the histamine was given daily and it is considered important that baths or

other additional treatment should follow and not precede its administration.

In the accompanying Table the various groups have not been subdivided and the nomenclature is based on the recommendations of the Arthritis Committee.

Clinical Analysis

	Males.	Females.	Total.	Cured.	Greatly improved.	Improved.	No change.	Worse.
Fibrositis	18	29	47	7	27	11	—	2
Neuritis	6	4	10	—	1	2	—	—
Osteo-arthritis ..	9	4	13	—	—	9	4	—
Rheumatic arthritis ..	1	2	3	—	—	1	2	—
Villous arthritis ..	3	20	23	—	14	—	—	1
Spondylitis	2	—	2	—	—	—	—	—
Traumatic arthritis ..	2	—	2	2	—	—	—	—

In this Table only the disabled parts that received treatment are considered: where there was a mixed condition the remaining disabilities are ignored.

NON-ARTICULAR CONDITIONS

Fibrositis.—The majority in this group had lumbar and shoulder-girdle fibrositis. Of the 47 cases, 7 were passed as clinically cured; all except one showed very great or great improvement, and in most of them it was believed that sufficient treatment would have completely removed the disability. The greater number had massage in addition to baths. The two cases which are reported as worse were complicated by an erratic "psyche" which precluded the possibility of relief from any ailment, and treatment was not persevered with.

Neuritis.—In this group are included cases of root and trunk sciatica, and brachial neuralgia. Of the 10 patients treated, 7 were discharged and have remained free from pain. Improvement was unsteady in all and there were occasional recrudescences, each less severe than the one before. One fell short of complete recovery because the patient persisted in taking forbidden exercise.

CHRONIC JOINT CHANGES

Osteo-arthritis.—Of the 13 cases, 9 showed improvement; 6 of these were of the hip, 2 of the knee, and 1 of the shoulder-joint. There was a steady lessening of pain and usually an increase of movement after the first application. Of 4 patients that returned only 1 had become worse in the interval (seven months). In 4 the improvement lasted only a few hours.

Rheumatoid Arthritis.—Only 3 patients were treated, and of these 1 alone showed definite improvement.

Villous Arthritis.—The knee was affected in each of the 23 cases, and there was almost always a very gratifying result, with loss of pain and greatly increased movement. Massage was given in every case. In this group again 1 patient failed to respond or persevere.

Spondylitis.—The 2 cases treated were both of the osteo-arthritic type, the patients being men of 35 and 38. There was much improvement in posture, with a great lessening of pain, and this progress had continued in one of the patients who returned after 3½ months for a second course. Plaster shells were fitted for night use, and baths and massage were also given.

TRAUMATIC CONDITIONS

Both the patients in this group had "badminton elbow" and recovered rapidly and uneventfully with

¹ Mackenna, F. S.: THE LANCET, 1934, i., 1228.

² Vas, S.: Deut. med. Woch., 1932, lviii., 1009.

five and seven administrations each. No other forms of treatment were used.

COMPLICATIONS AND INTERCURRENT DISEASE

Collapse.—There were three cases in which histamine treatment caused collapse.

CASE 1.—Female, aged 49. Fibrositis. Menopause at present; extremely neurotic. This patient did moderately well until the seventh treatment, but suddenly collapsed about a minute after beginning the eighth; the pulse disappeared at the wrist and there was slight vomiting. She gradually recovered after some hours, but had hysterical prostration afterwards. No remedy beyond the ordinary was employed.

CASE 2.—Female, aged 68. Sciatica and fibrositis. She was very neurotic and began to show signs of collapse after the third treatment, on the appearance of the facial flush. Ephedrine (1 c.cm.) was injected, with rapid improvement and complete recovery in about eight minutes. Subsequently five more treatments were successfully given and there was considerable improvement, but the patient became more "nervy," refused all treatment, and departed.

CASE 3.—Female, aged 73. Fibrositis and brachial neuralgia. This woman was very sensible and vigorous, and a first course of 42 treatments resulted in complete cure of the neuralgia and an improvement in the old-standing lumbar and gluteal fibrositis. A second course was started five months later but at the third treatment there was a dramatic and severe collapse. Rapid relief was obtained from ephedrine, and the patient afterwards declared that she felt better than for many years and that all the backache had gone. Further treatment was given to the lumbar region and there has been no return of pain after eight months.

With the exception of hysteria, which was conspicuously absent in the third patient, there was nothing remarkable about any of these cases, nor was the collapse due to an overdose in the usual sense. The onset of symptoms was sudden and not preceded by any visible signs, nor did the patient notice anything unusual. The most careful inquiry subsequently into diet, &c., failed to produce a solution. The collapse presumably bears some relation to the (so far unexplained) variation in histamine tolerance shown by each patient from day to day. Ephedrine appears to be an efficient antidote.

Intercurrent Diseases.—In 5 cases the systolic pressure was over 200 mm. Hg, and showed not only the customary post-histamine fall of several millimetres noted by Bisset and Woodmansey,³ and Shanson and Eastwood,⁴ but also a definite downward tendency throughout the course. This was, however, never greater than a total of 15 mm. Two cases of chronic asthma and bronchitis were included and appeared to be unaffected either temporarily or permanently by the drug; in other respects they progressed normally. Gross valvular and myocardial lesions were rejected, but those with less advanced disease that were suitable for bath treatment were accepted and took the histamine successfully.

CONCLUSIONS

It is to be regretted, for the purposes of this analysis, that other forms of treatment could not be excluded, but it is noteworthy that many patients who have taken a course of baths for several years are emphatic in their statements that histamine has greatly increased the benefit received; undoubtedly it also increases the rate of recovery. It may be said to fail in cases of the rheumatoid type, where the joints are swollen and "doughy" and the skin

clammy, but in all others, and particularly in villous arthritis, fibrositis, and neuritis, its value is unquestionable.

NON-TRAUMATIC SURGICAL EMPHYSEMA

IN ASSOCIATION WITH ACTIVE PHTHISIS

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SURGICAL emphysema occurring in a phthisical patient is usually superficial and due to faulty artificial pneumothorax technique. Interstitial emphysema, though it is not a very uncommon complication of broncho-pneumonia and whooping-cough, is rarely met with in pulmonary tuberculosis, presumably because of the fibrotic changes taking place in advance of the active lesion. When it does occur it generally follows an unusually severe bout of coughing which ruptures an alveolus and allows air to escape into the interstitial tissue of the lung, and so, by way of the hilum, to the mediastinum. From here the air passes to the subcutaneous tissue of the neck, face, and chest, thus establishing a "surgical" emphysema. This condition is believed to be rare enough to warrant the publication of the following case.

A man, aged 26, was admitted to Birkenhead Municipal Hospital on Nov. 12th, 1935, having a history of chest trouble of at least six years' standing. He was extremely emaciated and complained of asthenia and cough; the temperature was remittent, and sweating was profuse. Clinical examination revealed scattered patches of consolidation in both lungs, with fairly extensive cavitation at the right apex. Tubercle bacilli were present in the sputum.

No improvement took place during the next five weeks; emaciation became more obvious, and the cough assumed a paroxysmal character. On Dec. 19th, at 10.30 A.M., the patient complained of slight dysphagia and a bilateral swelling of the neck was noticed. By midday the neck had become increasingly swollen and crepitus was elicited on pressure. The superficial tissues of the chest wall and lower jaw became involved, and on the following day the face, particularly on the left side, was greatly swollen and disfigured, with massive involvement of the tissue of the lower eyelids. The patient was very dyspnoeic and becoming cyanosed. Sweating was profuse. On Dec. 21st the surgical emphysema had spread to the anterior abdominal wall and flanks, and was encroaching on the lower limbs. Breathing now became exceedingly embarrassed and death took place at 8.20 P.M., 58 hours after the onset of the acute symptoms.

On post-mortem examination both lungs were found to be studded with tuberculous foci with considerable cavity formation. No collapse was present on either side. The mediastinal tissues were ballooned up with air, and this could be traced to the subcutaneous tissues behind the clavicles.

There was no history in this case of artificially induced pneumothorax, nor did the post-mortem examination reveal any evidence of spontaneous pneumothorax.

I wish to thank Dr. R. A. Grant, medical superintendent, for permission to publish these notes.

ROYAL MASONIC HOSPITAL, LONDON.—The figures for this hospital for the last half of 1935 show an excess of expenditure over income of £7141, against £9425 in 1934, although the patients resident on daily average have been 125 against 113. Lord Marshall, in submitting the treasurer's report at the annual general meeting on Jan. 29th, stated that when the nurses' home was complete and ready for occupation the average costs would be further reduced and the position considerably improved.

³ Bisset, A. A., and Woodmansey, A.: THE LANCET, 1933, ii., 1018.

⁴ Shanson, B., and Eastwood, C. G.: Ibid., 1934, i., 1226.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF SURGERY

At a meeting of this section on Feb. 5th, with Mr. SAMPSON HANDLEY, the president, in the chair, a discussion on

Sterilised Surgical Catgut

was opened by Sir WELDON DALRYMPLE-CHAMPNEYS. He said that the occurrence recently in rather rapid succession of a number of cases of post-operative tetanus, either certainly or probably due to the use of what might be termed "home-cured" catgut, made it important to emphasise the dangers of inefficiently sterilised material; though control under the Therapeutic Substances Act had raised the general standard of sterility of surgical catgut on sale in this country. The raw material from which catgut was prepared was the small intestine of the lamb, and was heavily infected with micro-organisms of many kinds, including pathogenic spore-bearing anaerobes. On reaching the manufacturer the raw material was either thawed out (if frozen) or washed free from salt (if this had been used as a preservative) or, if dried, soaked in dilute alkali to make it soft and pliable. Even if not dried it usually received this soaking. The gut was next split into ribbons longitudinally and then scraped to remove the inner and outer layers, leaving only the submucosa. The ribbons were measured and spun, two or more ribbons being twisted together to form a string. The gauge of the finished gut depended on the number of ribbons spun together. Sometimes the ribbons were partially sterilised before spinning by soaking in disinfectant solution. The strings were dried under tension and polished with pumice or emery, and then graded by measuring their calibre with a gauge. It was important that the gauge of any individual string should vary only very slightly at different points in its length. If hard slowly absorbed gut was required the strings at this stage were immersed in a chrome bath. Gut partially sterilised before spinning was often sold as "internally sterile" or "partially sterilised" catgut and, as it was not called "sterilised surgical catgut," did not come under the control of the Therapeutic Substances Act. Purchasers of such catgut were apt to assume that the product required less sterilisation than raw catgut, and some of the wound infections following the employment of catgut sterilised by hospitals for their own use were, he believed, attributable to this erroneous assumption.

Heat was the most reliable sterilising agent, provided the physical properties of the gut could be preserved unimpaired. The heating of catgut rapidly in air to a temperature sufficient to destroy anaerobic spores, if it did not actually burn it, rendered the gut as hard as wire and extremely brittle. Methods had been devised for overcoming this difficulty, and some had proved completely successful, but there was a temptation to reduce the temperature or time of heating below the safety point if the tensile strength of the gut was found to be unsatisfactory. Iodine had been used for sterilisation of catgut because of its penetrating power. Owing to its colour, the degree of penetration of iodine could be verified by examining a cross-section of the gut. Excess of iodine must be removed at the end of the process because prolonged action rotted the gut, reducing

its tensile strength. The value of mercurial salts for sterilisation of catgut had been overrated; they were bacteriostatic only, though they had some disinfectant action on the exterior of the gut. Hydrogen peroxide was an efficient sterilising agent, but as it caused spun gut to swell it was never used alone, but employed for treating the wet gut as a preliminary to the action of iodine. Essential oils had a negligible action on spore-bearing bacteria, and it was difficult to account for their popularity among hospitals sterilising their own gut.

After sterilisation, the gut was introduced into containers, together with a filling solution. The principal types of container were sealed glass tubes; glass tubes closed with a rubber cork and metal screw cap; similar tubes containing several reels of gut, the ends of which were drawn out through side tubes, closed in the manner described; waxed cardboard cartons; and finally multiple sealed paper envelopes each containing a single coil of dry gut. Any packing which allowed repeated extractions of portions of gut from the same container must be regarded as highly unsatisfactory. Filling solutions should only be regarded as useful for killing organisms on the *outside* of the gut which had got there during packing. Tubes were sealed in the ordinary way in the flame of a blowpipe.

Catgut might become recontaminated:

(1) By handling before it was put into the container. Sterilisation inside the container was therefore desirable.

(2) By air-borne organisms, from dust or the breath of operatives, entering the container before sealing. This source of contamination might be avoided by the use of metal boxes with sliding lids to hold the containers, rubber gloves, face masks, and a glass shield over the sealing table.

(3) By the use of unsterile containers.

(4) By the use of unsterile stoppers in the interval between filling and sealing.

(5) By the use of unsterile filling solutions. Even solutions containing so-called antiseptics might provide such a source of contamination if they were incapable of killing the spores of anaerobes.

The examination of a reasonable length of any batch of catgut by sterility tests could not ensure that the whole of the batch was sterile. A licensee under the Act was required to carry out sterility tests on not less than 1 per cent. of the material constituting a batch. The control tests carried out by the licensing authority were identical with those which the licensee was required to perform as a routine.

In February, 1933, Dr. R. O. Clock, of New York, had published the results of bacteriological examinations of gut sterilised by different methods. He had concluded that "heat sterilisation properly controlled was the only safe and positive method for sterilising surgical catgut sutures." In a further paper published in December, 1934, he had given results of the examination of 1204 sutures emanating from Great Britain, France, Germany, Japan, and Spain, and had found that 4 of the 8 British brands, 1 of the 4 French brands, 5 of the 6 German brands, 2 of the 4 Spanish brands, and both of the 2 Japanese brands were non-sterile. His tests, however, were tests of *absolute* sterility and could hardly be regarded as practical for everyday control. Prof. T. J. Mackie, of Edinburgh, had found that ethyl alcohol, oil of cloves, oil of eucalyptus, phenol, and lysol had little action on bacterial spores. Formalin was more effective but

acriflavine and crystal-violet brilliant-green mixture were ineffective, and biniodide of mercury failed to kill spores after they had been exposed for 82 days to a 1:1000 alcoholic solution. He had confirmed Bulloch's unfavourable report on perchloride of mercury. Silver nitrate had proved lethal to spores, and so had boric acid, but both tended to damage the physical properties of the gut; the same applied to iodine trichloride. He had found iodine water to be effective, again confirming Bulloch's earlier findings. A combined hydrogen peroxide and iodine water method gave a sterile gut with good physical properties. Little was known about the factors which governed the fate of catgut in the living body, but Dr. V. D. Allison's recent work had shown extreme variation in resistance to tryptic digestion in vitro of commercial catgut. Mackie had reached the following conclusions in regard to the presence of *Bacillus tetani* in catgut: (1) the presence of the bacillus in the raw material was irregular and variable; (2) only certain batches of any commercially sterilised catgut might be contaminated; (3) bactericidal processes, even if not entirely effective, might destroy the majority of the spores; (4) survivors might be scanty and irregular in distribution; (5) the thickness and amount of catgut left in the tissues might determine the multiplication of the bacillus; (6) other factors might be involved, including perhaps factors affecting the power of spores to germinate in the tissues.

Certain cases of post-operative tetanus had lately come to the notice of the Ministry, one group from a hospital in the north and another group from a hospital in the south. In the northern group, two cases had followed operations for inguinal hernia, and the patients had recovered; the third, following nephrectomy, had proved fatal. The catgut used was bought raw and sterilised at the hospital by boiling in xylol for half an hour and then storing in spirit. Samples of gut similar to that used at the operations were examined and found to be heavily infected with aerobes and spore-bearing anaerobes, but *B. tetani* was not demonstrated. Some of the dry catgut before sterilisation, however, was found to contain the bacillus. Four cases occurred in the southern group, of which two ended in recovery and two were fatal. Both commercially sterilised catgut and catgut sterilised at the hospital were in use here, but the theatre sister thought it probable that hospital-sterilised gut had been used in the second fatal case, and might well have been used in the others. The method of sterilisation employed was immersion of the gut in oil of cloves for 14 days followed by storage in absolute alcohol for 8 days. Post-mortem material from the second fatal case and specimens of both kinds of catgut were examined, but *B. tetani* could be isolated only from the appendix stump. The tetanus spores might have been present in the patient's intestine and have infected the appendix stump, or she might have acquired her infection from the catgut. It was unlikely, however, that *B. tetani* was present in the bowel of all four of the cases affected, and moreover in two of them the bowel had not been interfered with at operation. The method of sterilisation employed at the hospital had been shown experimentally to be ineffective in killing tetanus spores, and altogether, although proof was lacking, the evidence indicated the conclusion that the infection came from the "home-cured" catgut. He appealed to surgeons to inquire into the methods employed for the sterilisation of the catgut they used at operation.

DISCUSSION

Prof. W. BULLOCH said that biniodide of mercury was perfectly useless. He had infected small hanks of sterilised silk ligatures with *Bacillus ruber* and had placed them in a solution of 1 per cent. biniodide. He had tested this material 40 times over a period of ten years and had obtained a pure culture of the bacilli on every occasion; what they lived on he could not say. He thought there were only two methods of sterilising catgut effectively: either by immersion in iodine solution for eight days or by heat. He believed that tetanus in catgut was a bogey. In 17,420 samples of catgut which he had examined he had never once found tetanus.

Prof. JAMES MCINTOSH said that all surgeons had encountered cases of post-operative tetanus. Tetanus bacilli could be isolated from the wound in such cases; in the last one he had examined, however, no tetanus had been obtained from the wound, but the wood-wool used to pack the splint had been found to be heavily infected with the organism. He thought we had yet to go a long way to prove that catgut was a source of post-operative tetanus infection.

Prof. PAUL FILDEN agreed that if too much attention was directed to catgut surgeons might overlook other important sources of tetanic infection. In his work he was often called upon to find the tetanus bacillus in sites where it was present—and he did find them; if he failed to find them elsewhere, therefore, it might count, he thought, as useful evidence that they were absent. And though he had found the bacillus in every one of 40 cases of tetanus he had never once found it in surgical catgut. He described a case of pyonephrosis in which excision of the kidney was followed by tetanus; the wound at post-mortem was swarming with tetanus bacilli, but though he examined 50 reels of catgut of the same brand as that used at the operation he had found no tetanus. In another case the knee-joint was excised for tuberculosis and the leg put up in a plaster splint. Three months later the patient developed tetanus and died. The whole operation area was excised and cultured but no tetanus bacilli were grown; but in the wood-wool used as dressing tetanus spores were found. He was convinced the infection of some slight abrasion from the dressing was responsible for the symptoms. He thought that more cases of post-operative tetanus occurred than were reported, and he hoped that every surgeon who encountered a case would put the facts on record so that they could be properly sifted.

Dr. JOHN BEATTIE said that the impregnation of catgut with silver salts gave a sterile gut with sufficient tensile strength for surgical purposes. This method might, it has been suggested, act merely by encasing the spores in silver, but if they were effectively imprisoned it did not matter whether they were living or not. The smaller hospitals often used unsuitable methods of sterilisation, and these must be replaced by a good method which was both simple and cheap. They could not all afford catgut which was sterilised under rigid conditions. He thought that tetanus in catgut was a bogey only as far as the London Hospital was concerned. Post-operative tetanus and wound infections due to catgut were much commoner at hospitals where catgut was not prepared so efficiently.

Dr. V. D. ALLISON said that he had been using trypsin to digest and soften catgut so that any organisms embedded in it might be induced to grow. He had found catgut digested in this way to be teeming with organisms—staphylococci, streptococci, spores, and vibrios, mostly dead. He had also tried

injecting extracts of catgut into animals and had once got tetanus from a sample of catgut requiring to be sterilised before use, but never from catgut declared to be ready for surgical use. A substitute for catgut was most desirable and a new material made from horseflesh was stated to be sterile, flexible, readily absorbed, and of good tensile strength. It was time new experiments were carried out to decide how long different catgut ligatures took to absorb. The rates of digestion with trypsin were very variable.

Lord HORDER remarked that the bacteriologists did not seem to confirm the responsibility of catgut for post-operative tetanus. Might the same arguments apply to gas-gangrene? He would also like to know to what extent surgical technique was dependent on catgut as against other forms of ligature. Was absorbability the great virtue of catgut determining its use?

Mr. W. M. DICKIE said that three areas where outbreaks of post-operative tetanus had occurred were areas in which heavy grades of catgut were commonly used. Such grades were hard to sterilise and persisted for a long time in the tissues. If the lightest possible catgut was used there was less likelihood, he thought, of getting tetanus.

The CHAIRMAN said that he rarely used catgut unless he was forced. He found that unabsorbable sutures, provided they were thin enough and sterilised just before use, were rarely attended by the disadvantages usually attributed to them.

Mr. CARWARDINE urged all surgeons to prepare their own ligatures and handle them in person until the last minute. He had always sterilised his own catgut by the xylol method, and he had never seen any tetanus.

Sir WELDON, in replying, said that the thesis that tetanus in catgut was a bogey had not been proved. The discussion had shown the need for further research. He trembled to think what would happen if all surgeons prepared their own catgut; not all of them could be trusted to perform the task as carefully and successfully as Mr. Carwardine.

SECTION OF LARYNGOLOGY

A MEETING of this section was held on Feb. 7th, with Mr. LIONEL COLLEDGE, the president, in the chair.

Mr. MAXWELL ELLIS read a paper on the mechanism of the

Bronchial Movements and Naso-pulmonary Reflex

He said that his interest in the subject had first been aroused when he was working in Dr. Chevalier Jackson's bronchoscopic clinic and noticed the movements in the bronchi of certain asthmatics. This led him to an attempt at recording these movements. He briefly described the muscular structure of the bronchial tubes, and pointed out that the muscle extends as a continuous network from the trachea to the air sacs. The fibres run neither circularly nor longitudinally, but obliquely, in "geodesic" lines, as depicted by William Snow Miller, enclosing lozenge-shaped spaces. They end at the mouths of the atria, surrounding these openings almost in the manner of a sphincter. It had been deduced from the structure of the bronchi that they elongate with inspiration, shortening during expiration, but different opinions had been expressed about the nature of the alterations in calibre.

Mr. Ellis said that none of the experimental methods of measuring and recording these movements did this directly. The classical investigations of Dixon and Brodie in 1903 consisted in measuring the changes in volume of a lobe of a lung. By other methods the variations in intrapleural or intratracheal pressures were recorded. It was doubtful whether these measurements were reliable records of variation in intrabronchial capacity, particularly as the experimental animals were in an abnormal condition, and usually kept alive by artificial respiration. Mr. Ellis said that his method of recording changes in calibre in the larger bronchi of the dog was a direct one involving the use of the bronchoscope. A specially devised hollow instrument carrying a rubber balloon which could be inflated through a separate tube was inserted through a bronchoscope into the right bronchus. The balloon was loosely inflated and connected with a Brodie bellows capable of registering clearly changes in volume of one-tenth of a cubic centimetre. Respiratory exchange in the lung distal to the balloon was carried on through the lumen of the instrument and changes in calibre were thus directly recorded. Mr. Ellis showed tracings obtained in this manner, in one of which the bronchial contraction produced by pilocarpine and the relaxation produced by adrenaline were seen. He pointed out that synchronously with the respiratory movements are rhythmic alterations in calibre—inspiratory dilatation and expiratory narrowing—which had been commented upon by Fletcher Ingals and Chevalier Jackson some years ago as a result of their bronchoscopic observations, but not previously recorded by a direct method. The means of production of this rhythm was of interest: (1) it could be produced by impulses travelling in the vagi; (2) it could be an intrinsic property of the bronchial tubes, or (3) a mechanical effect of the respiratory movements of the thoracic walls. The first two hypotheses demand rhythmic contractions of smooth muscle at the rate of at least 15 a minute, and this behaviour of smooth muscle was not seen elsewhere in the body. He showed a tracing from a bronchus before and after bilateral vagotomy in which the bronchus narrowed to an even greater extent after it had been deprived of its constrictor nerve-supply than previously, which seemed to be evidence against the first hypothesis. In numerous experiments the bronchial movements had followed exactly the respiratory movements. Mr. Ellis thought that during the inspiratory phase of respiration the increase in thoracic volume tended to create a decrease in pressure in the lung substance, which in turn caused air to flow into the bronchial tubes, dilating them. The flexible structure of the tubes would permit of this. He considered that the network arrangement of fibres in the myoelastic layer explained how shortening and narrowing of the tubes go hand in hand during the expiratory-phase (decrease in lung volume). He believed that the maintenance of tone is the function of the bronchial muscle.

He went on to discuss the question of peristalsis in the bronchi. Yandell Henderson's work on the "dead space" and its occasional rhythmic variation was the best available evidence about this function and was supported by Lewis's demonstration of contraction waves in tissue-culture preparations of bronchial tubes from chick embryos. In his own experiments Mr. Ellis had never witnessed rhythmic relaxation followed by contraction which would indicate the possible existence of peristalsis, but he had occasionally observed variations in tone. For

a true demonstration of the phenomenon records from two fixed points in a bronchus were necessary, and these had not been obtained. A certain amount of work had been done on the influence on respiration of reflexes from the nose, but nothing convincing had been published on the effects of such reflexes on the bronchi. Mr. Ellis showed tracings of bronchial reactions produced by stimulation of the septum with a moderate faradic current and of the right nasal cavity with dilute ammonia vapour. Bronchial constriction occurred often but not invariably. Such stimuli were stronger than those which occur in normal life and might evoke pain and defence reflexes which obscured the picture; clear-cut results were not easy to obtain. This might perhaps be explained by the different functions of the canine and human nose. The principal function of the former was olfaction, and of the latter respiration, and the microscopic structure of the mucous membranes indicated this difference. The human nose might be more sensitive to stimuli, but he had had no opportunity of carrying out experiments on man and had no objective evidence to offer. On stimulating his own septum with an electric current, he received no subjective sensation of constriction in the chest, but he had no idea how much bronchial constriction was needed to convey such a sensation. He felt convinced, however, that the tone of the bronchial muscle could be influenced reflexly from the nasal mucous membrane, although he was not prepared to be dogmatic as to the precise mechanism. Finally, Mr. Ellis pointed out that it was essential to know more about the normal dynamics of the bronchi in order to understand the abnormal mechanics of asthma and other spasmodic respiratory diseases.

Dr. G. EWART MARTIN mentioned observations that he had made on patients during bronchoscopy. Blowing cold air down the bronchoscope resulted in a closure of the bronchus which relaxed on the introduction of warm air.

Mr. T. A. CLARKE asked whether Mr. Ellis had made any observations on the subject of homolateral reflexes between the nasal cavity and bronchial tree. He had read descriptions of such reflexes.

Mr. H. V. FORSTER mentioned that in some patients in whom the larynx had been excised movements of the diaphragm were unequal on the two sides. He wondered if this affected the lung by promoting unequal bronchial dilatation and, perhaps, lung expansion.

Mr. A. R. TWEEDIE recalled a case where the patient, during the performance of a nasal operation, suddenly went into an asphyxial spasm. He passed a bronchoscope and saw what appeared to be a complete closure of the secondary bronchi by swollen mucosa.

In reply, Mr. ELLIS said that theoretically he would expect the bronchial muscle to react to stimuli applied locally to the overlying mucous membrane. He had not yet investigated this aspect of reflex behaviour. He doubted the validity of the work quoted by Mr. Clarke. On theoretical grounds, as the sensory arc ended in the medulla, spread to both sides was almost inevitable, and both vagal nuclei would almost certainly be affected. He had on several occasions observed effects on the right bronchus resulting from stimulation of the left nasal cavity.

In the case quoted by Mr. Tweedie he thought an extreme form of bronchial muscle spasm had occurred. The bronchial mucous membrane contained no erectile tissue, and did not convey the impression

that it could suddenly swell several millimetres. He thought it likely that for some unknown reason the bronchial muscle in this patient was unusually irritable and was reflexly stimulated by the nasal operation to extreme tonic contraction.

A number of cases were exhibited and discussed at some length.

SECTION OF TROPICAL DISEASES AND PARASITOLOGY

At a meeting of this section on Feb. 6th, with Dr. P. MANSON-BAHR, the president, in the chair, Prof. R. T. LEIPER presented a demonstration on the

Crustacea as Helminth Intermediaries

This took the form mainly of lantern slides illustrating the life-histories of the dibothriocephalus tapeworms, the Guinea worm, and *Gnathostoma spinigerum*, all using species of cyclops as intermediate hosts, and the life-history of the lung fluke which uses certain fresh water crabs and crayfish as second intermediaries. He said that the life-history of the guinea worm had been correctly deduced, on the analogy of that of a very different worm in fish, from the close similarity of their embryos. *Gnathostoma spinigerum*, normally parasitic in the stomach wall of cats and dogs, had been found several times subcutaneously in man. The lung fluke, parasitising man and some other mammals in the Far East, and dogs in Venezuela, had recently been reported from a child in West Africa. It was very important that regional collections of crustacea should be made so as to ascertain the distribution of intermediaries, but in that connexion it had to be remembered that the entomostraca were also intermediaries for a number of helminths not parasitising man. Among these were several tapeworms of the same group as dibothriocephalus, some species of the four-suckered tapeworm genus *hymenolepis*, and many acanthocephala. Caution was therefore needed in interpreting the discovery of helminth larvæ in crustacea.

Dr. B. G. PETERS followed with a paper on some recent

Developments in Helminthology

which dealt with certain biological aspects of parasitism, mainly among the cestodes. Normal life-histories, he said, were occasionally departed from, as when larvæ of *Dibothriocephalus mansoni* or *Mesocoeloides*, fed to dogs, continued to live as larvæ in the peritoneum instead of becoming adults in the intestine. De Waele's work tended to show that tapeworm embryos and larvæ resisted intestinal digestion only because the surrounding egg-shell and cyst wall, respectively, protected them from the host's gastric juice. The adult cestodes appeared to have an anaerobic metabolism in which glycogen was decomposed to furnish energy, and fatty acids and carbon dioxide were excreted as metabolic products. So-called "age immunity" in helminths was a form of innate immunity. Acquired immunity could be most fully illustrated from Miller's numerous experiments on the larval stage of the cat tænia. These had revealed active immunity, both natural and artificially induced, and also passive immunity, both inherited and induced. Of immunological reactions employed in diagnosis, the Casoni skin test for hydatid was a group reaction among the tæniæ. Intradermal and precipitin reactions appeared to have been established as valuable methods for the diagnosis of trichinosis, both in man and in the pig.

Dr. N. HAMILTON FAIRLEY said that most helminthic immunological reactions were of a group nature, probably owing to the existing crude methods of preparing antigens. It was usually easier to detect fixed antibodies, as in skin tests, than free antibodies concerning which there was less knowledge.

Major-General W. P. MACARTHUR said that in cysticercosis the complement-fixation reaction varied in intensity along with eosinophilia; both were high in early stages, then tended to disappear, and finally to reappear with the death of the cysts.

In reply to a question whether, in view of the spread of the "mitten crab" in Europe, some local mollusc might not serve as first intermediary to the lung fluke in place of melania,

Prof. LEIPER said that he thought this unlikely. Trematodes were more specific as to first than as to second intermediaries. Moreover, both the lung fluke itself and the habit of eating raw crab would also have to be introduced before this parasite could spread in Europe.

MIDLAND OBSTETRICAL SOCIETY

A RECENT meeting of this society, held at Birmingham, was devoted to a discussion on

Eclampsia and Pre-eclamptic States

Mr. S. W. MASLEN JONES (Wolverhampton) said that since the Obstetrical Congress of 1922 there had been a general adoption of purely medical treatment in eclampsia as opposed to active obstetrical interference. The essentials in treating eclampsia and pre-eclampsia were similar—namely, (1) rest; (2) starvation, giving nothing but water for 24–48 hours, and then adding fruit juice, carbohydrates, and milk; (3) intestinal lavage and saline purgation; and (4) free intake of alkaline fluids. In eclampsia nursing in the left lateral position was essential, because it allowed escape of blood and mucus from the mouth and air-passages; lavage of stomach and colon should be done as a routine leaving magnesium sulphate in the stomach. In unconscious patients fluid should be given per rectum; if this was returned, intravenous or even submammary salines might be necessary. Fluids should never be "pushed," however, before the bowels were acting freely, since there was a danger of waterlogging the patient. The value of drugs was disputed: morphia in a dose of up to gr. $\frac{1}{2}$ was useful for controlling restlessness during labour, but it often failed to stop fits, and was not entirely safe in cases with pulmonary oedema. Induction of premature labour was not done often enough in eclampsia: if there was no conspicuous improvement in the patient's condition, and no sign of spontaneous onset of labour, after 24 hours' medical treatment labour should be induced by aspiration of liquor amnii with the Drew Smythe catheter. In severe pregnancy toxæmia, without fits, the use of induction called for much discrimination. After the 36th week he advised induction in severe cases which had responded to treatment, whereas before this time medical treatment should be continued unless the patient was getting worse, since the viability of the child was of importance; but in the latter type of case it must be remembered also that intra-uterine death of the child was common.

Mrs. BERTRAM LLOYD agreed that it was dangerous to give too much fluid in the early stages of treatment; she advised induction in cases of pre-eclampsia

if medical treatment produced no improvement within three weeks. In her experience eclampsia was rare in hospital cases. At the Birmingham Maternity Hospital there had been 87 cases in the past six years. Delivery was spontaneous in 56 cases; forceps were used in 19; Cæsarean section was done once. In 4 cases labour was induced, and 6 patients died undelivered. The maternal death-rate was 25 per cent. and the fetal 47 per cent.

Mr. ALFRED DANBY said that as the primary cause of the pre-eclamptic state was still unknown, all forms of treatment for this disease (or syndrome) must be empirical. Recent experimental work in America suggested that some of the untoward symptoms of eclampsia were due to "water intoxication," and he wondered whether this suggestion would have any influence on the fetish for forcing fluids to dilute the "toxins." The three cardinal signs of pre-eclampsia were raised blood pressure, oedema, and albuminuria, of which the last-named was probably the least important. It was now known that water retention could occur without visible oedema, and any undue gain in weight in the last trimester of pregnancy was suggestive of this so-called "hidden oedema." The generally recognised fact that free diuresis was usually followed by rapid improvement in the general condition seemed to indicate a functional rather than organic derangement of the kidneys. In this connexion Mr. Danby was particularly interested in the work of Hoffmann and Anselmino (1931) who were able to demonstrate that the blood of eclamptics contained two components of the posterior lobe hormone—namely, the anti-diuretic and the pressor. These factors were not present in the blood of normal women, pregnant or otherwise. Goodall (1933), commenting on this work, which was done upon rabbits with controls, considered that it showed a consistent uniformity of reaction that placed the antidiuretic content of the blood of these patients beyond doubt; the pressor substance was present only in cases of high blood pressure, 180 systolic or over. It appeared, however, that Hoffmann and Anselmino's observations had not yet been confirmed by other workers. Whilst the physiology and pathology of water metabolism was still imperfectly understood, the speaker felt that it had a considerable bearing on the subject under discussion. During the past few years he had treated a number of cases of pre-eclampsia showing oedema by fluid limitation and dehydration—a method modified from that of Arnold and Fay (1932). The results had been excellent as far as they went, but the cases were specially selected. In many instances the change in the external appearance of the patient and the reduction in weight due to loss of fluids was very striking. Although the diet contained over 50 grammes of protein, including meat, he had seen no ill-effects from its use; but most of the patients complained of thirst. In eclampsia he was convinced that the injections of hypertonic solutions had given improved results, probably through dehydration and diuresis. He usually employed a 25 per cent. solution of glucose intravenously, but occasionally intramuscular injections of 25 per cent. magnesium sulphate were given in addition. The free use of sedatives, including Sodium Luminal hypodermically, were part of the routine treatment, and all forms of interference—such as colon wash-outs, rupture of the membranes, and application of forceps—were done under chloroform anaesthesia. The objection to the use of small quantities of chloroform was in his opinion more

academic than real. As regards Cæsarean section, although he admitted there might be an occasional case where it should be done, he had never had occasion to perform the operation for eclampsia.

Mr. H. L. SHEPHERD said that in Bristol eclampsia was becoming less common; during the past ten years he had seen 80 cases, with 9 deaths, whereas before the war the average was 15 cases per annum. He believed that eclampsia and pre-eclampsia should be treated on different lines; for although the primary toxin was undoubtedly formed in the placenta, the fits were caused by absorption of toxic products from the bowel. The greater number of deaths in eclampsia were due to intracranial hæmorrhage, a direct result of the high blood pressure and the fits. Hence the most important part of the treatment of eclampsia was to reduce the blood pressure and control the fits, which he thought could best be done by free venesection and the use of morphia. Subsequently the usual eliminative treatment of the bowel should be adopted and protein omitted from the diet with the idea of sparing the liver and giving it every chance to recover. He considered it dangerous to allow too much fluid. Pre-eclampsia, he believed, was always associated with constipation, which led to the higher breakdown products of proteins being absorbed unchanged. Constipation should therefore be treated energetically. The value of induction of labour lay mainly in the relief of intra-abdominal pressure; hence the fact that withdrawal of liquor amnii through catheters gave better results than bougies. Calcium, both by mouth and intravenously, was of value at all stages.

Mr. WENTWORTH TAYLOR, speaking of the Dublin method of treatment, said that it did not consist in a fixed and unalterable régime. While the basic principles of Tweedy's treatment were still generally applied, each case was dealt with on its own merits. To some extent he had been impressed with the efficacy of the treatment, and in his personal experience of 62 cases he had only had 9 deaths; in all the fatal cases post-mortem examination had revealed some gross failure of the human organism such as cerebral hæmorrhage or massive necrosis of the liver or kidneys, which no form of treatment could be expected to influence. Pregnancy toxæmia could be classified broadly into four separate types. (1) *Pernicious vomiting* should be treated in the first place by securing a proper action of the bowel and by correcting any malposition of the uterus. If this preliminary attack failed the patient lost weight rapidly, continued to vomit, and developed jaundice and acetonuria. In these circumstances delay was dangerous and the uterus should be emptied by abdominal hysterotomy in the sure knowledge that rapid improvement would follow. Evacuation by insertion of tents was too slow. (2) In the *pre-eclamptic state* starvation need seldom be carried beyond two days and never beyond four. If there was no improvement after this time, labour should be induced. Hysterotomy might be necessary in severe cases before the 25th week. (3) In *eclampsia* he advised an initial dose of morphia gr. $\frac{1}{2}$ - $\frac{3}{4}$. If this failed to control the fits a major cerebral lesion was probable, and no further morphia should be given. Venesection was not popular in Dublin, since eclamptic patients were in any case anæmic during the puerperium. Cæsarean section at or near term was never necessary since it was easy to stimulate the uterus to empty. (4) In *toxic antepartum hæmorrhage* treatment by plugging the vagina was seldom attempted now. It was preferable to treat by

puncturing the membranes, allowing the waters to escape and the uterine cavity to close down, after which spontaneous delivery was the rule.

Mr. T. C. CLARE (Leicester) was not convinced that toxæmia was the right descriptive term for the condition under discussion. He was now converted to Paramore's mechanical theory of origin of eclampsia. The essential in treatment was to stop the fits. The results published by Stroganoff were so remarkable that he felt that the danger of using chloroform for this purpose was less than generally believed. He personally used spinal anæsthesia to lower the blood pressure, and regarded it as safer than venesection. It could be repeated if necessary. He asked whether Evipan had been tried for control of the fits. He thought that oxygen played an important part in treatment.

Prof. MILES PHILLIPS (Sheffield) said that eclampsia was rare in treated cases. It was important that the honorary surgeon should see cases of pre-eclampsia at least three times in the 24 hours. At Sheffield they had used the Stroganoff method of treatment since 1922. Induction of labour should be done when a pre-eclamptic patient became worse, and it was important to listen to the fetal heart twice daily. He thought that Veratrone and venesection were both of value, but that it was easy to overdo the administration of fluids. He mentioned that eclampsia was extremely rare in Holland—a fact attributed to the salt-free diet.

Prof. H. J. DREW SMYTHE (Bristol) believed in giving large doses of morphia in eclampsia. He said that a pre-eclamptic required protein to reduce œdema.

Mr. C. L. SOMERVILLE (Leicester) said that in the treatment of eclampsia he advised immediate venesection followed by intravenous anæsthesia, preferably with Pernocton in a dose of from 3-4 c.c.m. There was no risk of damage to the liver. The patient slept for 5-7 hours, and was not restless on waking. Fits were rare after this. The effect of evipan was too transient for its use in eclampsia. He believed in giving pilocarpine to produce sweating.

Prof. D. C. RAYNER (Bristol) advised rupture of the membranes as soon as possible in eclampsia. If pilocarpine was used there was a danger of drowning the patient.

ROYAL MEDICAL BENEVOLENT FUND.—At a recent meeting of the committee 9 new applicants were assisted and 54 grants were renewed. In all the sum of £1680 was voted. The following are particulars of a few cases helped.

Widow, aged 28, of M.B. who died in May, 1935. Both her parents died when she was a child leaving only sufficient money to insure the child's education. In July, 1932, she married, but in May, 1935, the husband died leaving the widow at the age of 28 with two infant children, and a capital sum of £380. The fund and its auxiliary, the Ladies' Guild, will do what is possible to help.

Widow, aged 78, of M.R.C.S. who died in 1890, was found to be living on a yearly income of £66. The fund granted £25 thus raising the income to £91, which is the limit allowed for retaining the State old age pension of £26.

Daughter, aged 37, of M.R.C.S. who died in 1908. After her father's death she was educated from 9 to 15 years at Dr. Barnardo's Home. She then had to earn her own living and went into domestic service. As she is a dwarf she is unable to do any strenuous work and her power of earning is limited. It is estimated that her earnings for the last month at odd jobs was only £2. The fund voted her an allowance of £26.

As this is the centenary year of the fund a special appeal is being made for new subscribers to carry on the work begun a hundred years ago and for donations towards the centenary fund. Cheques should be sent to the hon. treasurer of the fund, 11, Chandos-street, London, W.1.

MEDICAL SOCIETY OF LONDON

Prof. G. E. GASK, the president, took the chair at a meeting of this society on Feb. 10th, when a discussion on the

Treatment of Sterility

was opened by Mr. C. S. LANE-ROBERTS. Absolute sterility in the female, he said, could often be corrected nowadays by plastic operations on the adnexa, and one should seldom give up hope of conception. Most couples should be allowed to go on from twelve to eighteen months without investigation unless an obvious cause was present. The investigation at the Meaker clinic for sterility in Boston was amazingly thorough. The team consisted of a urologist, a gynaecologist, an internist, an endocrinologist, and a clinical pathologist. The basic routine study required a full week and consisted of six steps: the medical histories and examinations of husband and wife; the gynaecological history and abdominal examination; examination of the semen; endocrinological studies of husband and wife; transuterine insufflation; and further necessary medical or surgical procedure. Meaker's nine major headings for the causes of sterility were: deficient spermatogenesis; obstruction and occlusion in the male genital tract; hostility of prostatic-vesicular secretion; faults of delivery and reception of semen; hostility of endocervical secretions; "uterine blockade"; tubal obstruction and occlusion; impassability of ovario-tubal hiatus; deficient oögenesis. Constitutional disorders impaired fertility, and success might be achieved by combating general debility, endocrine dysfunction, metabolic disturbance, and chronic intoxication. The urological examination must be very thorough, but a well-balanced outlook must be maintained. Perhaps the American workers laid too much stress on endocrine disturbance. In an American series of 4000 cases the large bulk of the males were said to have shown anterior pituitary dysfunction with faulty spermatogenesis, some with thyroid deficiency and some with disturbance of the islets of the pancreas. In some cases of male genital hypoplasia it was claimed that the injection of prolan gave promising results. Many cases of sterility were due to inability to perform the sexual act, and simple and direct advice would often be successful.

On the female side, the sooner an external dyspareunia was dealt with the better. Spasm of the pelvic floor muscles was common, and easily and quickly remediable. It was usually neither necessary nor advisable to perform plastic operations on the vagina. Huehner's work on post-coital examination in cases where intercourse failed to produce cervical insemination had led to the conclusion, among others, that the normal alkaline endocervical mucus was an environment favourable to spermatozoa, and that the acid vaginal moisture was hostile. The significance of premature ejaculation was therefore obvious. Marked anteversion of the cervix, so that the external os was covered by the anterior vaginal wall, often went with hypoplasia, scanty periods, an undersized uterus, an elongated cervix, and a pinhole external os. Chemical hostility of the endocervical secretion and serological hostility were probably not very important, and bacterial hostility might be grossly exaggerated. Excessive viscosity in the cervix might, however, be due to bacteria, and a mechanical viscosity to poor cervical drainage; this could be treated by dilatation and draining

for a few days. A douche of dilute hydrogen peroxide or sodium bicarbonate shortly before coitus was useful. Endocervicitis should be thoroughly treated, either by linear cauterisation or by diathermy with the burr or cutting loop. Retention cysts should be dealt with. Curettage of the endocervix and chemical antiseptics seemed quite useless. Chronic passive congestion might be cured by correcting such faults as coital excess or habitual excitation of the female without proper orgasm. The correct treatment of chronic constipation and uterine retrodisplacement also helped. A deficiency of the pre-coital secretions demanded instruction for the husband. There were only two indications for artificial insemination: imperfect "delivery-reception," and hostile endocervical secretion. Uterine blockade mostly implied the deformity of the uterine cavity or obliteration of the tubal lumen by fibroid tumours. A carefully done myomectomy with meticulous hæmostasis was often followed by pregnancy. The mildest gonorrhœal salpingitis caused damage to the tubal mucosa. Puerperal and post-abortive infections might cause adhesions and occlude the tubal ostia.

Of recent years lipiodol salpingography had been almost universally adopted. Ordinary insufflation methods were of help when the tubes were found closed at laparotomy. The best time for tube testing was immediately after a period, when the epithelium was at its lowest. Only a very chronic case was suitable for salpingostomy. Any proposed plastic operation should be thoroughly explained to the couple. In 366 cases treated by Bethel Solomons with tubal resection, 8 per cent. became pregnant and 18 per cent. either became pregnant or showed tubal pregnancy. Adhesions and folds should be dealt with and a prolapsed ovary might be stitched up. Some workers reported success in cases of sterility with mid-menstrual pain by bursting the follicle under anaesthesia, and others by shaving off the surface of the ovary to facilitate the rupture of the follicle. Small X ray dosage was sometimes used for oögenic dysfunction.

Of the constitutional causes, chronic intoxication should be excluded. The diet should be regulated and vitamin E and protein given. Slimming and obesity would both cause sterility. Lack of exercise, over-work, nervous fatigue, and anæmia could be treated by change of habit and scene.

ENDOCRINE FACTORS

Mr. Lane-Roberts summarised Knaus's work on the physiology of ovulation, but set against Knaus's theory of "safe periods" following and preceding menstruation the results published by Dickinson, who found that impregnation could take place at any part of the cycle, including the period itself. He discussed in some detail the endocrine causes of sterility, in relation to the use of oestrogenic and gonadotropic hormones. Thyroid, he said, might be employed with great advantage, even with a normal basal metabolism. Progesterin was remarkably useful in threatened or habitual abortion; in the treatment of sterility it should be given in association with œstrin in the last third of the menstrual cycle in order to prepare a suitable premenstrual nidatory phase. In some cases of primary ovarian failure, 10 units of insulin before breakfast and dinner improved genital function. Out of 150 cases of functional sterility treated by hormones, dilatation and diagnostic curettage, and low-dosage radiation of the pituitary and ovaries, 53 per cent. had become

pregnant and 42 had carried to full term. In the vast majority of cases the infertility factors would be gradually sifted out by general and local physical examination of husband and wife, with appropriate treatment; Huehner's post-coital examination of spermatic fluid; tests for tubal patency; and special measures such as endometrial examination and tests of the basal metabolism.

DISCUSSION

Mr. A. C. PALMER said that by far the commonest cause of sterility in woman was some degree of genital imperfection or under-development, which included acute antelexion. This displacement could not, of course, stop one spermatozoon, but would stop the fluid which carried the sperm cells, especially if it was abnormally viscous. Salpingitis sometimes did not damage the tubes, but filled the pelvis with adhesions which did not necessarily close the abdominal ostium, and yet somehow by their presence prevented the sperm from reaching the ovary. Their simple removal was sometimes followed by pregnancy. Tiny fibroids or fibromyomata and adenomyomata in the isthmus might block a tube so that gas did not pass at 200 mm. Hg, and laparotomy might be justified. He was working on a technique of cutting out the growth together with a large part of the isthmus, making an incision in the top of the fundus, cutting a big channel in the uterus and embedding the ampullary portion of the tube. This had appeared to lead to patency, but its value had still to be proved.

Mr. V. B. GREEN-ARMYTAGE said that anovular menstruation was a far commoner cause of sterility than was generally appreciated. If a very fine curette were passed just before the period and a cheese-paring were taken from the endometrium at the top of the uterus, hypoplasia would be found with no secretory phase. Out of 7 of his patients treated for the first two weeks after the period with 100,000 units of Oestroform twice a week, and with three doses of 30 rat units of Prognon during the last ten days of the cycle, 4 had become pregnant after three months, one with twins. Greater stress should be laid on the value of lipiodol injections, which apart from their diagnostic value were therapeutic in at least 20 per cent. of cases. This procedure was apt to be neglected in London, to the discredit of London gynaecologists. The insufflation test was more or less useless; he had known clubbed or phimotic tubes to be declared patent on the strength of this test. It was a mistake to use catgut, which was easily absorbed, for uterine implantation; silk-worm gut gave far better results.

Dr. WILLIAM MOODIE drew attention to the psychological factors which might cause sterility in apparently normal couples, some maladjustment or imbalance preventing successful coitus. A faulty attitude to sex, the married situation, and life generally explained many such troubles. Mental causes might have actual physiological repercussions, and mental and physiological readjustment must proceed together. A person might be sterile with one partner and fertile with another.

Mr. W. MCK. McCULLAGH said that he could not understand why lipiodol should pass through a tube if gas could not. Patients surprisingly often became pregnant when their tubes were not patent to ordinary gas. The tubes might open some days after an unsuccessful insufflation. Fear probably had an influence in sterility; a certain veterinary

surgeon had owed his great reputation for the successful mating of horses to his practice of thoroughly startling the mare first by chasing her round the yard with a whip. The speaker claimed 48 per cent. of successful results with insufflation in a series of 50. Impregnation might be achieved by stopping the husband's tobacco, ordering a seaside holiday, or giving thyroid and calcium, which latter increased sexual desire in females.

Mr. GREEN-ARMYTAGE answered that Rubin had established that carbon dioxide caused spasm of the tube whereas lipiodol did not; moreover, the gas had therapeutic value in only 10 per cent. of cases as against the 20 per cent. of lipiodol.

Mr. JOHNSTON ABRAHAM suggested that better results might be obtained if the husband was always sent to a urologist. Sterility due to the male was far higher than the 12 per cent. mentioned by Mr. Palmer, and it was easy to see whether a man was fertile or not by semen examination. In a case of double epididymitis, implantation of the vas into the top of the epididymis might cure the sterility. Recent gonorrhoea did not sterilise a man, but chronic prostatitis would thicken the spermatic fluid and impede the action of the spermatozoa. Many men were impotent though quite fertile, and in these cases artificial insemination might be performed.

Dr. HENNING BELFRAGE laid stress on the importance of diet and the necessity of correcting vitamin imbalance, especially in city-dwellers.

Mr. HOPE CARLTON inquired about the incidence of sterility in men after operation for neoplasm of the prostate. If the enlargement was of the whole prostate, he suggested, fertility would probably be destroyed, but an adenomyoma might leave it unimpaired. Young's operation had become popular in America because it was believed not to cause sterility. The closure operation by the Harris technique was said to allow the spermatozoa to pass without being lost in the bladder.

THE FOTHERGILL TESTIMONIAL FUND

THE following is the second list of subscriptions received in response to the letter published in the *British Medical Journal* and *The Lancet* of Jan. 18th :

Amount previously acknowledged, £262 14s. 6d.
 Lord Dawson of Penn (London), £5; R. Langdon-Down (Teddington), £10 10s.; G. T. Willan (Hove) and G. C. Trotter (London), each £1 1s.; J. C. Loughridge (Belfast) and J. Armstrong (Ballymena), each £1; W. W. Shrubshall (Burgess Hill), £2 2s.; T. Brice Poole (Hove), £3 3s.; J. Manson (Warrington), £2 2s.; H. S. Souttar (London), C. O. Hawthorne (London), and Bolton Local Medical and Panel Committee, each £5 5s.; J. Mills (Ballinasloe), Isle of Wight Local Medical and Panel Committee, G. Morgan (Brighton), and Mid-Cheshire Division, B.M.A., each £1 1s.; Portsmouth Division, B.M.A., £5 5s.; W. C. Chaffey (Hove), £2 2s.; W. Gosse (Wimborne), £5; J. Henderson (Glasgow), £2 2s.; E. Kaye Le Fleming (Wimborne), £5 5s.; Halifax Panel Committee, £2 2s.; Sir Humphry Rolleston (Haslemere), £5 5s.; Shropshire and Mid-Wales Branch, B.M.A., £2 0s. 6d.; S. Watson Smith (Bournemouth), £2 2s.; H. C. Jonas (Barnstable), £5; J. B. Miller (Bishop-briggs) and B. E. A. Batt (Bury St. Edmunds), each £1 1s.; R. G. Gordon (Bath), £3 3s.; Berks Panel Committee, £5 5s.; West Suffolk Panel Committee, £10 10s.; L. Kilroe (Rochdale), £5; C. L. Batteson (London), J. C. Lyth (York), A. K. Smith-Shand (York), and W. V. A. Kelly (York), each £1 1s.; Wakefield, Pontefract, and Castleford Division, B.M.A., £3; H. E. Barrett (London) and J. A. Brown (Birmingham), each £1 1s.; H. S. Beadles (Romford), £5 5s. Total £336 7s.

Cheques should be made payable to the Fothergill Testimonial Fund, and addressed to the treasurer, Fothergill Testimonial Fund, British Medical Association, B.M.A. House, Tavistock-square, London, W.C. 1.

REVIEWS AND NOTICES OF BOOKS

The Natural History of Disease

By JOHN A. RYLE, M.A., M.D., F.R.C.P., Regius Professor of Physic in the University of Cambridge; Consulting Physician to Guy's Hospital. London: Humphrey Milford, Oxford University Press. 1936. Pp. 438. 15s.

To Dr. Ryle's many friends—colleagues, pupils, patients—his new title of Professor must still sound a trifle strange. It carries with it a faint suggestion of intellectual detachment, of academic as distinct from broadly human attitude, which are no part of his character and work as they are known. He has long stood high in the esteem of the English medical world as a general physician—"albeit with an abdominal bias," as he puts it. That is a greater achievement than the industrious ascent of a specialist ladder, and the method and the philosophy that lie behind it are to be gathered from this series of his papers assembled from the medical journals of the past decade. Ten of them, representing the bias, deal with gastro-intestinal subjects, and another score or so with other diseases or symptoms. What do I know about this condition? In what sorts of patients have I met it? In what circumstances? What course does it follow? How precisely can its manifestations be described? What then can I infer about its cause, or its significance, or its later behaviour?

Such questions as these seem to have been the starting point of each essay, and the next step every time was to bring out the writer's own case records and examine them. "Full notes, frequently perused, are the essence of clinical education." There emerges a clinical description, or a discussion of relationships, that is usually simple and direct, yet in some way illuminating, setting matters in a better perspective. The method so exemplified is frankly preached in the opening paper and in one or two at the end of the book. It is the method of the field naturalist, who watches—pencil and notebook in hand—the play and interplay of natural forces and the behaviour of living things. It demands quick and full and accurate observation, immediate and correct recording, and a close examination of the facts in search of sequences and relationships. Dr. Ryle's belief is that this method, old as Hippocrates, is by no means outworn; there are many facts yet to be observed by watching different diseases in different men, and much useful knowledge to be had from studying them. The newer experimental method, applied directly in man to the problems of disease, has its own value and its own field, but the whole future does not lie with it. Medicine, as both art and science, will be not only well practised but also carried forward by the physician with the touch of the naturalist in him, gaining a wide experience and using it wisely and critically. This is sound philosophy. It denies nothing to the experimental method except monopoly. It needs emphasis to-day, not because the experimental method challenges it, but because the development of specialisation, the advent of numerous physical and chemical methods, and commercial enterprise in the therapeutic field have combined to foster in the clinician a neglect of his peculiar opportunity, and a narrow and uncritical attitude.

No one can be in a better position to oppose those tendencies than the professors of medicine, and it is significant that Dr. Ryle, on becoming one

of them, should re-emphasise the value in medicine of a broad basis of experience and a closer observation of the natural history of disease.

The Minor Medicine of General Practice

By L. V. SNOWMAN, M.A., M.B. Cantab., M.R.C.P. Lond., Physician to the Eastern Dispensary; Assistant Pædiatrician, Jewish Maternity Hospital. London: John Bale, Sons and Danielsson, Ltd. 1936. Pp. 104. 2s. 6d.

PATIENT and doctor will continue to disagree about what constitutes minor medicine so long as the former thinks in terms of discomfort and the latter in terms of prognosis. Although Dr. Snowman's little book, despite its title, discusses a number of morbid conditions which will be regarded as minor by neither patient nor doctor, for the most part his comments on their causation and treatment will be found apposite and useful. In the chapter on coryza, though rightly condemning central heating as a predisposing factor, he advocates the use of watery douches in the treatment of nasal obstruction where many nowadays prefer oily sprays. He says, rather surprisingly, that it is rare for a respiratory infection in a well-nourished individual to cause a true bronchitis and omits to mention a rapid pulse as an early, and often solitary, physical sign of phthisis. The point that unexplained pain, labelled *faute de mieux* rheumatic fibrositis, often turns out to be due to herpes zoster is well taken, and if borne in mind may do much to enhance a doctor's reputation. Dr. Snowman believes that children must be hardened to our inclement weather if rheumatism is to be prevented, and he is eminently sane on the bog of constipation. In the dietary advised for simple diarrhoea he makes no mention of weak tea, the astringent action of which has much to commend it. In the chapter on cardiac disorders he perhaps lays undue stress on the height of the systolic blood pressure and too little on that of the diastolic, and he claims that the "trained finger" can diagnose hypertension—a debatable point. His remarks on so-called depressor substances are, however, sensible and timely.

Altogether a well-written and sound little book.

Notable British Trials

Trial of Alma Victoria Rattenbury and George Percy Stoner. Edited by F. TENNYSON JESSE. London and Edinburgh: Wm. Hodge and Co. 1935. Pp. 298. 10s. 6d.

THE sixty-fourth volume in the series of Notable British Trials contains the proceedings against Mrs. Rattenbury and George Stoner for the murder of the former's husband at Bournemouth less than a year ago. The masterly handling of the trial by Mr. Justice Humphreys would alone make the book worth study. If the Court of Criminal Appeal found it merely "a sordid and squalid case," Miss Tennyson Jesse rehabilitates romance in a pleasantly provocative Introduction.

Stoner, aged 18, was engaged as chauffeur by Mrs. Rattenbury, aged 38, and her husband, aged 67. Within two months she gave him a bedroom inside the house and became his lover; within six months her elderly husband was discovered dying with his

head battered in. A doctor, hastily summoned late at night, found Mrs. Rattenbury in a state of drunken excitement, with a gramophone playing and all the lights on. She kept saying she had killed her husband and, when formally charged, said "I did it deliberately and would do it again." She was tried jointly with Stoner on an indictment for murder; she would have been guilty in law if she had counselled or advised the deed even if she had not been present when the blows were struck. She went into the witness-box, denied her guilt without casting any blame on Stoner, and was acquitted. Stoner, who had told the police that he struck the blows, did not go into the box and was found guilty. It was said for him that the Rattenburys were going on a visit, that he was morbidly jealous at the prospect of his mistress resuming marital relations with her husband, and that he hit the husband to give him some hurt which would stop the visit rather than to kill him. It was a hopeless defence. There was also a curiously fugitive suggestion that young Stoner was a cocaine addict, suffering from insane hallucinations. His counsel asked the jury to say Stoner was either "guilty but insane" or else guilty of manslaughter and not of murder. The judge told them he saw no ray of evidence to support insanity. Stoner's counsel had said "he does not deny that it was his hand that struck the blow." As the judge observed, counsel cannot properly make an admission in a criminal case when the client is not put in the box. Three days after Stoner's conviction and her own acquittal, Mrs. Rattenbury committed suicide with remarkable determination, stabbing herself in the breast six times with a knife (three of the wounds penetrated the heart) on the bank of a stream whence her body fell into the water. Stoner's appeal was dismissed, but he was reprieved. Somewhere he is alive, not yet 20, and with his story and his portrait in this book ready to help the public not to forget him when he is free. Is this quite fair?

The Gallic *esprit* of Miss Tennyson Jesse scores several points against our insular prejudices. She derides the Anglo-Saxon attitude of contemptuous condemnation towards the man and woman (and especially the woman) unlucky enough to be found out in sexual delinquency. If Mrs. Rattenbury suffered from nymphomania, the fact was not admirable but neither was it blameworthy. Another Anglo-Saxon trait is attributed to the judge when he stigmatised the husband as a "*mari complaisant*, not a nice character"; Mr. Rattenbury's indifference was "not necessarily a despicable attitude." Worst, and most Anglo-Saxon of all, is the idea that Mrs. Rattenbury, being older, dominated the much younger man. The truth is, says the Introduction, that no woman is so completely dominated by her lover as the elderly mistress of a very young admirer. In support of this thesis Miss Tennyson Jesse prints a singular letter by Benjamin Franklin to a young man on the advantage of choosing an elderly mistress. It is frank enough to bring a blush to the marble of his statues in Philadelphia and other transatlantic towns where the inscriptions credit him neither with cynicism nor with sophistication. The Introduction criticises the reiteration by judge and counsel of the words "adulterous intercourse." The assize court, it reminds us, is a court of law and not of morals. But the law, having to assess the truthfulness of a witness, considers itself entitled to take into account the witness's character. And the prosecution was inviting the jury to consider whether a woman might not be so lost to decency that, to gain her ends and

particularly for sexual gratification, she would stop at nothing, not even at murdering her elderly husband—especially if she had not to strike the blow herself. Miss Tennyson Jesse's lively advocacy of Mrs. Rattenbury rebuts the suggestion and makes an interesting study of character.

The Patient and the Weather

By WILLIAM F. PETERSEN, M.D. Vol. I., Part I. The Footprint of Asclepius. Michigan: Edward Bros., Inc. 1935. Pp. 127. \$3.75.

THE second and third volumes of this voluminous work have already been reviewed in THE LANCET, when it was stated that there was inevitable delay in producing the first volume. And now that the first volume arrives it is described as Part I., so that the general introduction is not yet complete. What we have now is an interesting essay on Greek medicine with its different approaches to medical problems, while an able summary of Hippocratic arguments leads up to detailed information as to the influence of the weather in relation to particular diseases. Here racial differentiation is taken into consideration, although this side has been dealt with in another section. These chapters are profusely illustrated with maps showing the percentage distribution of the "old-age group" (65-75 years) in the United States, and the distribution of this group for the coloured races, the information being obtained from the U.S. census of 1930. Other maps figure the distribution in various States of under-height, under-weight, myopia, defective hearing and teeth, mortality of infants from malformation, distribution of various forms of insanity, and suicide rates. The general suggestion in these chapters may be fairly summed up by considering that variations of disease based on environment may be mainly referred to climate and the mutations of weather. One such generalisation may be quoted: "Wherein lies the difference in the European environment and the American? Wherein the energizing effect? What can cause the increase in autonomic dysfunctions? I believe the explanation is a relatively simple one. While it is true that Europe has a typically cyclonic climate, the cyclonic disturbances are neither as frequent nor as violent as those in America. In Europe the rate of travel of the storms is only about half that of the speed that they attain in America. Very rarely does the degree of barometric fluctuation reach the amplitude that we find so common along our storm tracks. It is the abruptness of the autonomic adaptation demanded by these changes that is of greatest moment."

The completion of Vol. I. has still to appear, and it is not quite clear in how many parts that will be issued. So no attempt can be made to estimate definitely the value of this large and far-reaching production until the remainder comes under review. It seems likely that part two of Vol. I., announced as shortly forthcoming, may not prove the conclusion of the work. Enough has been published to show that Dr. Petersen is supplying the medical profession, and the public, with a compendium which must prove a useful book of reference. The second and third volumes were reproduced by lithoprinting so that a considerable saving of expense was brought about. In the first volume the ordinary method of production has been followed, and both the type and the definition of the illustrations may be commended.

REPORT OF THE DEPARTMENTAL COMMITTEE ON CORONERS

THE departmental committee appointed by the Home Secretary in February, 1935, to inquire into the law and practice relating to coroners, and to recommend what changes are desirable and practicable, has brought in its report (H.M. Stationery Office. Cmd. 5070. 1s. 3d.). The committee was made up of Lord Wright (chairman), Sir Archibald Bodkin, Sir Farquhar Buzzard, M.D., Mr. Digby Cotes-Preedy, K.C., Sir Arthur Hazlerigg, Mr. George A. Isaacs, Mr. W. Rutley Mowll, Mrs. Margaret Winttingham, with Mr. A. Johnston, of the Home Office (secretary). The committee held 19 meetings and examined 68 witnesses. Its main recommendations are summarised for reference as follows:—

The office of coroner should be retained, the coroner's jurisdiction being limited to the investigation of the facts how, when, and where the death occurred and this investigation of facts being clearly distinguished from any trial of liability, whether civil or criminal.

In cases of suicide the press should be prohibited from publishing an account of the proceedings at the inquest; though the inquest should be held in public, as at present. All that the press should be allowed to publish is the fact that an inquest has been held, the name and address of the deceased, and the verdict that the deceased died by his own hand.

The verdict of *felo de se* should be abolished, and the verdict in cases of suicide should simply be that the deceased died by his own hand.

No inquiry into the state of mind of the deceased should be made in cases of suicide save in so far as it might throw light on the question whether he took his own life, and no reference should be made in the verdict to the state of mind of the deceased.

The coroner should no longer have the power to commit any person for trial on the inquisition on a charge of murder, manslaughter, or infanticide; and the inquisition should not name any person as guilty of one of these offences.

In any case in which questions of criminality are involved the laws of evidence should be observed; and where a person is suspected of causing the death he should not be called and put on oath unless he so desires, and should not be cross-examined.

A coroner should be obliged to adjourn an inquest for 14 days, if requested to do so by a chief officer of police on the ground that he is investigating the circumstances of the death to determine whether he should proceed for an indictable offence; and the inquest should be adjourned for further periods of 14 days if the chief officer of police repeats his request.

Coroners' courts should be prohibited from dealing with questions of civil liability.

Verdicts, or riders to verdicts, of censure or exoneration should be prohibited, but this prohibition should not extend to recommendations of a general character designed to prevent further fatalities.

The coroner should have a discretion to dispense with the holding of an inquest in the case of deaths due to simple accidents, or to chronic alcoholism, and likewise in the case of deaths under an anæsthetic or during an operation. He should be obliged to hold an inquest in cases of suspected industrial disease.

Arrangements should be made to ensure that post-mortem examinations in cases of deaths due to anæsthetics are carried out expeditiously.

Post-mortem examinations ordered by coroners should, save in exceptional cases, be made by pathologists whose names appear on a list to be kept by the Home Office. In compiling the list, the Home

Secretary would be advised by an expert advisory committee. There should be a special list of pathologists competent to conduct post-mortem examinations in certain cases of industrial disease.

The coroner, if so requested by a chief officer of police before the conclusion of an inquest, should direct a post-mortem examination to be made. If an inquest is not being held, or an inquest has been concluded, the chief officer of police should have power to order a post-mortem examination subject to the approval of the Director of Public Prosecutions.

Steps should be taken to secure the provision of better mortuaries and of places for post-mortem examinations.

A Rules Committee should be established to make rules for the conduct of inquests and the procedure to be followed by coroners generally. The committee should consist of persons appointed to represent the Lord Chancellor, the Home Secretary, Coroners Society, General Council of the Bar, Law Society, British Medical Association, and general public.

A Disciplinary Committee, similarly constituted, should be created to deal with complaints about the conduct of coroners.

Coroners should give, where practicable, reasonable notice of the time and place of inquests, especially in cases of industrial disease.

The coroner should have a discretion to view or not to view the body.

The London County Council should be empowered to prepare a scheme for the approval of the Home Secretary, setting out the areas to be served by each coroner's court provided by the council.

The provisions of Section 84 of the Coal Mines Act, 1911, in regard to the notification of inquests and representation of interested parties, should be extended to all industrial cases.

Coroners should keep adequate records of the evidence taken before them at inquests, and copies should be available to any person who shows proper cause on payment of a fee.

In these cases in which the coroner has at present a discretion to dispense with a jury, he should in future sit without a jury, unless there are reasons which appear to him to render the presence of a jury desirable.

In jury cases the coroner should be empowered to hold a preliminary sitting of the inquest where desirable without the presence of a jury, for the purpose of receiving evidence of identification and issuing a burial order.

Juries should be drawn from the jury list and, where a jury is empanelled in an inquest on a woman, child, or infant, at least two women should serve on the jury.

Steps should be taken, whenever practicable, to merge the smaller coroners' jurisdictions in larger areas.

In future, only solicitors or barristers should be appointed as coroners, but, whenever possible, they should have had experience as deputy coroners and should have a knowledge of forensic medicine.

Coroners should not act in their professional capacity as solicitors in matters which have been the subject of investigation at inquests held by them as coroners.

Deputy coroners and assistant deputy coroners should be appointed and paid by the same authority as appoints the coroner, after consultation with the coroner to whom the deputy is being appointed.

A coroner's officer should in all cases be a serving police officer.

Legislation will be required to give effect to most of these recommendations. The report is signed by all the members of the committee except Mr. Mowll, who submits a minority report. Sir Archibald Bodkin signs subject to reservations set out in a memorandum. Comment is made in a leading article on p. 377.

THE LANCET

LONDON: SATURDAY, FEBRUARY 15, 1936

THE FUTURE OF THE CORONER

UNANIMITY is a cardinal virtue in a Royal Commission or Departmental Committee. The Committee on Coroners is unanimous on one point only—namely, that the abolition of the coronership is neither practicable nor desirable. It has examined the Scottish system of private investigation of unnatural deaths by the procurator fiscal and does not find its adaptation to England to be feasible. The reason is that the procurator fiscal's inquiries in Scotland are part of his ordinary duties in the prosecution of criminal offenders on behalf of the Crown. As has been pointed out in these columns, there is no such exclusively official scheme of prosecution in England where the proportion of indictable offences undertaken by the Director of Public Prosecutions is much less than one per cent. of the total. The conclusions of the Committee's report (Cmd. 5070. H.M. Stationery Office. 1s. 3d.) are printed on another page. Some of them, as we shall see, involve fresh legislation. But it is noteworthy that one experienced legal member of the Committee, Mr. W. RUTLEY MOWLL, found himself unable to sign his colleagues' report, while Sir ARCHIBALD BODKIN, who speaks with almost unique authority on the administration of the criminal law, signs it subject to weighty comments and reservations. It may well be, therefore, that a Coroners (Amendment) Bill will not be introduced immediately.

Several of the current complaints of coroners' practice and procedure, declared by the Committee to be well founded, are criticisms which the more judicious coroners escape. They are points in which the high level of the best of these tribunals could be uniformly attained by all if attention were drawn by Home Office circular to what needs to be avoided. Coroners ought to know, for instance, that the law courts condemn the employment of the same persons as jurors at inquests again and again. The decision in *R. v. Divine, ex parte Walton* in 1930¹ left no doubt about this; yet the Committee is told of a town where the coroner's jury regularly consists of the inmates of the workhouse. Such a practice is a scandal; the Committee recommends legislation to secure that inquest jurors be chosen from the ordinary jury list and that at least two women jurors be summoned where the inquest concerns a woman, child, or infant. Another indefensible impropriety is the making of irrelevant animadversions upon the conduct of persons who are in any way brought before the tribunal. The Committee cites an inquest upon a girl of 19 who was said to have had sexual

relations with a much older married man. Medical evidence entirely disproved an allegation that he had been responsible for her death; yet the coroner, at the request of the jury, went outside his province and censured the man for his relations with the deceased. Other coroners, the Committee says, use their public position to attack the beliefs held by Christian Scientists or to criticise the administration of a hospital, the status and competence of its medical staff, and the specific method of a patient's treatment. Thus an individual finds himself condemned without redress or right of appeal. The Committee insists that this practice must stop. It desires also to prohibit coroners' juries from bringing in riders imputing responsibility (even where moral blame is disclosed) or purporting to exonerate. The only permissible riders, it insists, are those which contain proposals for limiting the recurrence of fatalities. Interested parties are all too fond of turning an inquest into a skirmish over civil liability, groping for admissions which may later be useful in the county court or High Court and wasting time over minor allegations of negligence which are outside the plain issue before the coroner. The purpose of an inquest is, after all, made clear by Section 4 of the Act of 1887. The inquisition is to elucidate three matters—first, the identity of the deceased; secondly, how, when, and where he came by his death; and thirdly, if he came by his death by murder or manslaughter, the persons (if any) whom the jury find to have been guilty.

Hitherto we have mentioned criticisms which, if all coroners had been blessed with the wisdom of Solomon, no Committee need have been constituted to meet. We come now to the Committee's proposals for altering the law in directions where the best of coroners could take no step unless Parliament first decides the policy. The Committee recommends that the third of the above-mentioned statutory purposes of an inquest be cancelled, that the inquisition should no longer name anyone as guilty of murder, manslaughter, or infanticide, and that the coroner should no longer have power to commit persons for trial. If questions of criminality arise, the laws of evidence are to be observed; if a person is suspected of having caused the death, he is not to be called and put on oath unless he so desires, and he is not to be cross-examined. Already, under Section 20 of the Act of 1926, inquests are adjourned as soon as criminal proceedings are launched before the magistrates. It is unnecessary and inconvenient to have two concurrent investigations, and the coroner stands aside when the ordinary procedures of prosecuting an offender are definitely taken. In future, the Committee proposes, the coroner will adjourn at the request of the police on their mere assurance that prosecution is possible. The coroner is also to direct a post-mortem examination, if the police so desire, before an inquest is ended. If an inquest is not held, or if it is already over, the police are to have power to order a post-mortem examination subject to the approval of the Director of Public Prosecutions. These proposals are evidently based

¹ THE LANCET, 1930, i., 426.

on two ideas—the unfairness of a coroner plying a suspect with questions, and the uselessness of the inquest as an aid to the police in the detection of offenders. On this latter point the experts differ. The majority report of the Committee assumes that the inquest can contribute little, even in poisoning cases. A witness from Scotland Yard declared that the private questioning by the police of possible witnesses or possible suspects was more likely to elicit information than the proceedings at an inquest. Moreover, witnesses who represented the police forces outside London disclaimed any desire to use inquests as a means of extracting incriminating information. But there may still be old-fashioned folk who fear that private questionings by the police can be as grave an abuse as public interrogations by a coroner. Sir ARCHIBALD BODKIN points out that, if essential witnesses refuse to disclose their knowledge to the police, and if there is consequently not enough evidence to justify an arrest, the present system of the inquest is the only other method of compelling disclosure. He regards the coroner's powers in such cases as valuable adjuncts to the present administration of the criminal law.

There will probably be less controversy over the Committee's recommendations as to cases of suicide. Until modern times the law lagged behind the public intelligence. It dealt with self-murder (*felo de se*) by forfeiting the dead man's goods to the Crown and by burying his body at the cross-roads without religious ceremony and with marks of infamy in order to mark the ecclesiastical condemnation of his offence. The verdict of unsound mind became popular to mitigate these harsh consequences. It has outlived the conditions which were thought to justify it, and, if it were taken seriously, it would confuse the national statistics of crime and insanity. If the law applied to suicides the same tests of criminal responsibility as are insisted upon in the criminal courts, few persons who have taken their own lives would be found of unsound mind. To remedy this curious convention of insanity at inquests, the Committee boldly proposes (as did the Chalmers Committee on Coroners in 1910) to abolish the verdict of *felo de se* in the coroner's court; it will no longer be his duty to attribute felonious responsibility; the verdict will simply be that the deceased died by his own hand. Further, to prevent the imitative suicide and the publicity which relatives must find so painful, the press is to be prohibited from giving an account of inquests on suicides. The inquest is still to be held in public but the newspapers are to publish only the fact of the holding of the inquest, the name and address of the deceased, and the bare verdict that he died by his own hand. This will involve legislation on the lines of the Judicial Proceedings (Regulation of Reports) Act, 1926, which was passed to suppress unsavoury details, especially in divorce cases. The proposal will encounter not only the opposition of the journalists but also the practical difficulty of the coroner, who cannot announce that the case is one of suicide until the verdict is returned. The Committee

suggests that he should state at the outset that a verdict of suicide is possible, whereupon the press would be forbidden to publish any account till the verdict was ascertained. If the law eliminates from inquest verdicts all reference to the deceased's state of mind in cases of suicide, coroners will no longer need to read in court letters and other intimate documents written by him which are often painful and harmful to living persons. It may still be necessary to inquire into the state of a dead person's mind in order to decide whether he took his own life; suicide may still remain self-murder in law; but a great reform will have been achieved if the Committee's proposal receives effect.

Other recommendations are important to the medical profession. It is proposed that post-mortem examinations, ordered by coroners, be made by pathologists whose names are on a national panel constituted by the Home Office with the guidance of an expert advisory committee. A special panel would be available for cases of industrial disease, and it is suggested that the Coroners Acts be amended to include among unnatural deaths any death believed due to illness or disease (including poisoning by gas, vapour, or fumes) resulting from the nature of an employee's work. In recognition of the higher standard required of pathologists on the Home Office panels it is proposed that the post-mortem fee be raised from two to three guineas and that travelling expenses and a fee for attendance at the inquest be allowed. At the same time it is suggested that the ordinary medical attendant of the deceased should be entitled to an appropriate fee for supplying a report on the case or attending an examination. It is often important to collate the clinical and the post-mortem evidence. A further recommendation that better provision be made for mortuaries and places for post-mortem examinations was long overdue. A few important miscellaneous recommendations remain to be mentioned. It is proposed that the coroner should have discretion to dispense with an inquest where deaths are due to what the Canadian laws call "mere accident or mischance," or to chronic alcoholism or where death occurs under an anaesthetic or during an operation. It has long been a matter of comment that in one coroner's district a major operation resulting in death becomes the subject of an inquest, while in another district a similar case is not even investigated by the coroner. Some coroners hold inquests only where death actually occurs on the operating-table, others whenever death occurs before the patient regains consciousness. The previous Committee, which reported in 1910, recommended that all deaths under an anaesthetic should be reported to the coroner, that he should have a discretion as to holding an inquest, and that the hospital or other public institution concerned should hold a scientific investigation. The Minister of Health took up this proposal in 1920, but it has been difficult for hospitals to take action inasmuch as the dead body comes under the control of the coroner.

Lastly, we come to the proposals affecting the

coroner's office. The recent report does not press for whole-time coroners, but it has embodied the suggestions of the Bar Council to the effect that in future only barristers or solicitors should be appointed. It is doubtful whether there is any public demand for this limitation. The inquest in South Dorset on Mr. JEFFERYS ALLEN, an old gentleman of 86 who was found dead with his head against a coal fire, is singled out for prolonged comment by the Committee and indeed is possibly the cause of the Departmental Committee having been constituted a year ago. That inquest was not held by a medical coroner. There are at present in England 268 coroners who are barristers or solicitors, 37 who are medical practitioners, and 4 who have no professional qualifications at all. While it is proposed to eliminate the medical coroner here, it is worth noting that in New York the coroner has been replaced by medical examiners who, since 1918, have sole charge of the medical investigation of sudden, violent, and suspicious deaths. Doubtless in England the influence of the Lord Chancellor makes for a preference for legal coroners. This legal influence it is now proposed to extend by giving the Lord Chancellor fresh powers of removing unfit coroners and by creating two new committees. A Rules Committee is to make rules for procedure at inquests. Naturally much will depend on the nature of the rules. A power to make rules was given to the Lord Chancellor by the 1926 Act and he has made little use of it. The second committee is to be a Disciplinary Committee, apparently on the lines of the tribunal which, under the Solicitors Acts, takes up the grievances of clients and enforces standards of professional conduct. Coroners will be haled before this body for censure. There is no such tribunal where members of the public can obtain redress when annoyed by the behaviour of judges, recorders, or magistrates. If the coroner is worth keeping at all, he should remain as an independent judicial officer who can do his work fearlessly without the risk of being harassed by disgruntled witnesses or unsuccessful advocates.

SALT AND THE SUN

It is difficult for the European to understand the prominence given to salt in the phrase and fable of the East. Here, where its lack is improbable, it ranks merely as one, perhaps the highest, among the condiments: there, it is one of life's necessities; the salt of the earth is second only to the water of life—indeed, the gods, in Egypt for example, have been worshipped as "givers of bread and salt." With animals it is of even greater importance; big game can be induced to forsake an ancient drinking pool simply by moving a block of rock salt, and no herd of cattle is without its licking-stone. In temperate climates this need for salt is not apparent because there is ample in the food to balance excretion. In the tropics, however, its value is shown when it is realised that in the least oppressive circumstances a man may lose by sweating alone as much salt as he normally absorbs from his diet. The average volume of sweat in the hot weather in

India is seven litres a day, containing about 20 g. of sodium chloride, and this is the amount in the normal diet; as the daily requirements in these circumstances are at least 32 g. there is a considerable deficit to be supplied by the tissues. It was to this that, in a letter to our columns,¹ Lieut.-Colonel O. R. McEWEN attributed the vague ill-health and loss of efficiency so common in the white inhabitants of hot countries. Though differing in degree, this state is similar to that giving rise to the severe miner's cramp described by Prof. K. N. MOSS, when the fluid lost by excessive sweating is replaced only by water. Referring to Colonel McEWEN's theory, Sir WALTER LANGDON-BROWN later drew attention² to another and severer form of the condition in the tropics known as functional hypo-adrenalism. He compared it with Addison's disease which is very similar in its great salt excretion, its symptoms of asthenia, lassitude, insomnia, anorexia, and achlorhydria, and its response to sodium chloride. He thought that this knowledge should diminish the zest with which salt-free diets were often prescribed, especially in asthenic states. The effects of a severe deficiency of sodium chloride were described on Jan. 30th at the Royal Society. Dr. R. A. McCANCE had given a diet with the least possible sodium chloride, collecting all the excretions and estimating the sodium in the body. Fluids were not restricted and the low protein was augmented by "ashless" casein. It was found that there was a deficiency of 25-35 per cent. of the body sodium, with symptoms of weakness, fatigue, and muscular cramps; the blood showed a rise in the cell count, viscosity, hæmoglobin, protein, and urea. Health was regained when sodium chloride was restored to the diet. This action does not seem to be purely that of any electrolyte, for E. H. DERRICK found³ that ammonium chloride was ineffective in relieving miner's cramp; the sodium is at least as important as the chloride. These observations show that a large proportion of the indefinite, if not the serious, effects of torrid climates can be avoided, with the intelligent coöperation of the cook, by greatly increasing the salt intake.

The growth of industry and settlement in the tropics has made the whole subject of the effects of great heat one of increasing importance, but as usual ignorance of their nature is betrayed by the confusion in nomenclature. The different types are vaguely and variously called heat prostration, heat exhaustion, heat-stroke, sunstroke, and miner's, stoker's, and fireman's cramp, though the clinical syndromes themselves may be well defined, and there is no better inclusive title than "the effects of heat." The prevention of these is simple, but inventive science seems to have stopped short at punkahs, long drinks, and short shifts. Climate is treated with the same casual tolerance shown to the other states dismissed as being beyond man's control, and even in the last decade the construction of refrigerated offices in Calcutta suffered the editorial scorn of a London newspaper.

¹ THE LANCET, 1935, i., 1015. ² Ibid., p. 1069. ³ Ibid., p. 38.

The human body, however, can adapt itself to conditions with great extremes of temperature, from exploring the Poles to mining in the tropics; it is only when mechanisms fail, which in ordinary emergencies are enough to protect the organism, that illness occurs. Almost always this is due to purely physical changes in the internal fluids, CLAUDE BERNARD'S milieu intérieur, upon the delicate adjustment of which depends the life of every cell. LEE⁴ has divided the effects of heat into four groups: heat cramps, dehydration, heat-stroke in the nervous system, and heat exhaustion in the circulatory; the first two are due directly to

changes in the water-salt balance, and the others to the high temperature. Experiments upon miners on the Rand⁵ and in the Urals⁶ have shown that the great majority of casualties can be prevented by carefully estimating the heat tolerance of recruits and then by acclimatising them with graded work. By such simple measures as good ventilation, light clothing, suitable drinking fluids, and careful training, this type of disease can be limited until it becomes merely the penalty for negligence, instead of a danger to a large part of the population at home and abroad.

⁴ Lee, Douglas H. K.: *Trans. Roy. Soc. Trop. Med. and Hyg.*, 1935, xxix., 7.

⁵ Dreosti, A. O.: *Proc. Transvaal Mine Med. Officers' Assoc.*, 1934, xiii., 32.
⁶ Starkov, P. M., and Jikesh, J. V.: *Jour. Indust. Hyg.*, 1935, xvii., 247.

ANNOTATIONS

PURIFICATION OF THE HÆMOPHOIETIC FACTOR

PROGRESS towards identification of the hæmopoietic (blood-forming) substances in liver has been curiously slow and discouraging. There are two reasons for the delay: first, experience has shown that most of the chemical methods which would otherwise be appropriate result in inactivation of the product; secondly, it is hard to find suitable clinical cases for testing the activity of isolated extracts. Lately, however, there has been an outburst of successful activity in widely scattered laboratories. Dakin and West in New York last year prepared a substance, to which the name Anahæmin has been given, which appeared capable of inducing a remission when given in doses as small as 80 mg. A few weeks later Strandell and his colleagues in Sweden reported that they had been able to obtain from 100 g. of liver a substance so highly purified that 2 mg. would induce a remission. Two papers published in our present issue record the further progress made in this country, and our readers will agree that the Medical Research Council has performed a useful service in supporting these investigations and in arranging for anahæmin to be submitted to clinical trial under the supervision of acknowledged experts working in conditions which permit of exact control. Prof. Davidson, Dr. Ungley, and Prof. Wayne emphasise the difficulty of assessing potency in tests limited to a small number of cases, but are able to conclude that anahæmin is highly active for blood regeneration; indeed, in their experience no other liver extract given in such small amounts has produced such striking results. Preliminary observations indicate also that this highly purified fraction may prove to be equally potent in the treatment of the nervous manifestations. The English preparation seems rather less active than the original fraction described by Dakin and West, since 80–150 mg. of the latter usually induced a maximal response, whereas the observations of Ungley and his colleagues suggest that only rarely is an average dose of 359 mg. maximally effective. Dr. J. F. Wilkinson likewise confirms the value of the new methods of fractionation introduced by Dakin and West; he found that 58–120 mg. of a fraction similarly prepared were maximally effective. But he has carried purification even further, and gets maximal responses with total doses of only 18–36 mg., representing an original amount of 660–1332 g. of fresh liver. Further

analysis of the chemical nature of this fraction will be eagerly awaited.

Though treatment with the less highly purified preparations already available for parenteral injection is extremely satisfactory if properly carried out, these recent attempts to purify the effective principle are of great theoretical importance; for it is only when the chemical constitution of the effective principles in liver and stomach are known that the complex relationship of these substances will be understood. Castle's original hypothesis that the effective factor in liver is formed by the action of an extrinsic factor (present in beef muscle) with an intrinsic factor in gastric juice has recently been questioned, and an alternative explanation of the observed experimental results is put forward by Greenspon,¹ who suggests, on the strength of experiments at present rather incompletely reported, that it is unnecessary to assume the existence of any extrinsic factor at all. He believes that the hæmopoietic factor in gastric juice is normally inactivated by pepsin; the beef (or other source of extrinsic factor), when incubated with normal gastric juice, binds pepsin and prevents it from inactivating the anti-anæmic principle, but does not provide any other essential principle. The arguments and experiments with which this suggestion is supported are stimulating, but they leave many important points which are more adequately explained by Castle's hypothesis. The answer to these important theoretical problems lies in the hands of the chemists, working in close collaboration with the clinicians, as has been done in carrying out the work reported in our columns to-day.

EXPERIMENTAL HYPERTENSION

THE repercussions of renal disease upon the cardiovascular system are still a subject of lively debate. On the one hand is the incontestable supervention of arterial hypertrophy and persistent high blood pressure upon a primary Bright's disease. On the other hand is the fact that experimental ablation of one or both kidneys has, on the whole, demonstrated that mere reduction of renal tissue will not of itself initiate a rise of blood pressure, though there is reason to believe that gradual reduction of renal tissue, either by excision or by ligaturing vessels, will lead to a rise of pressure when the borderline of the amount of tissue necessary for life is approached. Puzzling and apparently irreconcilable is the occasional finding, in children, of an advanced stage of chronic

¹ Greenspon, E. A.: *Jour. Amer. Med. Assoc.*, January, 1936, p. 266.

Bright's disease without accompanying cardiovascular hypertrophy.

The present impracticability of reproducing in animals a nephritis comparable with Bright's disease in man may be responsible for most of the negative results of attempts to establish an experimental hypertension by means of known irritants. Considerable interest therefore attaches to the claim of Dr. W. M. Arnott and Dr. R. J. Kellar,¹ working in Edinburgh, to have produced hypertension in rabbits by intravenous injection of sodium oxalate. The difficulty of estimating the blood pressure was overcome by a modification of Van Leersum's technique, in which a loop of the carotid is brought to the surface and enclosed in a tubular strip of skin. It is noteworthy that the observed rise of pressure, which appears to be statistically significant, was not maintained for longer than twelve days after which there was "a pronounced instability." Further experiments² were carried out by the same workers on a large series of rabbits in order to elucidate the mechanism of the hypertension. They found that the blood pressure tended to fall after bilateral nephrectomy, and that administration of oxalate to such animals shortened the survival period but did not influence the level of the blood pressure. When one kidney only was removed the usual hypertensive response was obtained with oxalate. Arnott and Kellar therefore concluded that the hypertension was of renal origin. Their view was strongly supported by a further experiment, on a series of 18 animals, in which one kidney was removed and the other denervated. Thirteen animals survived and were then given a course of oxalate injections; no hypertension was observed. The inference from this is that the mechanism of oxalate hypertension in rabbits is of the nature of a nervous reflex. In attempting to assess the importance of these observations it should not be forgotten, first, that oxalate nephritis is essentially a tubular nephritis without demonstrable lesions in the glomeruli; secondly, that the hypertension produced by these experiments appears to be of short duration. In these respects there is a wide gulf between this experimental condition and the nephritic hypertension of man, but the demonstration of a nervous mechanism in any form of hypertension is a progressive step.

OXYGEN DEBT AND CHEST MOVEMENT

In the search for methods of assessing the efficiency of the respiratory apparatus more than one worker has attempted to arrive at some way of using oxygen consumption under fixed conditions as an easily measured test for respiratory efficiency. The use of "oxygen debt" as such a test has certain superficial attractions and, according to a preliminary account³ by H. C. Jacobaeus, G. Nylin, and B. Almberg, may be of some value. Oxygen debt is defined as the amount of oxygen used after cessation of a period of exercise in excess of the resting oxygen utilisation for the same length of time and, although the mechanism is by no means simple, this phenomenon is closely related to lactic acid formation during the exercise. Nylin already claims to have shown that, with a measured amount of work, patients with heart disease have an increased oxygen debt when cardiac failure occurs. In the present study patients suffering from pulmonary disorders, especially advanced silicosis, were found to have

values for oxygen debt in excess of expectation. It was decided to see whether this finding could be connected with diminished movements of the chest wall, and a series of ten subjects were examined with and without constriction of the thorax by means of a stiff belt. This had the effect of reducing an average vital capacity of 4.5 litres to 2.4 litres. The effect of the belt was reflected in the oxygen debt which was always materially increased, in certain instances resembling the type of increase found in severe heart failure. The authors conclude that the mobility of the thorax plays a more important part in the cardio-respiratory functions than had been hitherto accepted. Further investigation which is in progress might well include a study of what is happening in the blood as regards lactic acid and carbon dioxide. The depletion of bicarbonate during exercise has to be made good and interference with respiratory movements must affect the amount of carbon dioxide blown off as well as the oxygen taken in. The links between movements of the thorax and the chemistry of muscular exercise are many, and a wide survey will be needed before it can be assumed that oxygen debt affords a simple test of cardiac or pulmonary efficiency.

EPIDEMIOLOGY OF TUBERCULOSIS

THERE are still some who believe that adult tuberculosis is due to the reawakening of a focus acquired in childhood, and perhaps more who do not admit that the disease is infectious, at all events to a degree which should forbid the association of a patient with other individuals under ordinary conditions of living. Anyone entertaining these beliefs will have them severely shaken if he studies a series of papers recently published¹ by F. M. McPhedran and E. L. Opie, which record the latest results of a study of tuberculosis, with the earlier stages of which many of our readers are familiar. These authors have for years past observed tuberculosis in a large section of Philadelphia, not merely as it affects individuals, but as it attacks families, and their chief conclusion may best be stated in their own words. "The spread of tuberculosis occurs in large part by long drawn-out family or household epidemics, in which the disease is slowly transmitted from one generation to the next."

The evidence on which this statement is based is voluminous, detailed, and closely analysed. The criteria used to determine the existence of the infection are the intradermal tuberculin test, the skiagram, and clinical examination. For purposes of deduction, families are divided into those in which a member has tubercle bacilli in the sputum, those including a member with tuberculosis but without discoverable bacilli in the sputum, and those with no known contact with the disease. The frequency of a positive tuberculin reaction during early years, and of manifest tuberculosis both then and in later years is, in different degrees and at different ages, unmistakably or even overwhelmingly greater in the first two of these categories than the last. It is to be inferred that the absence of tubercle bacilli from the sputum on such occasions as those when it was examined does not mean that they had at no time been present. Findings of this kind have been recorded before; we may recall a report² edited by Dr. G. Lissant Cox on the fate of young children in tuberculous households of Lancashire. What is perhaps more interesting and more contro-

¹ Brit. Jour. Exp. Path., 1935, xvi., 265.

² Jour. Path. and Bact., January, 1936, p. 141.

³ Acta med. Scand., 1935, lxxxvi., 455.

¹ Amer. Jour. Hyg., 1935, xxii., 539, 565, 644.

² See THE LANCET, 1920, i., 1201.

versial is the argument used to sustain the thesis that pulmonary tuberculosis in the adult is acquired by recent contact, and does not result from the renewed activity of a focus acquired in childhood. Among the ingenious methods of analysis and presentation by which the authors' extensive data are utilised to this end is the unusual device of the three-dimensional diagram. The whole argument is incapable of condensation, but one item of evidence can be stated quite briefly: it is that among individuals exposed to infection for the first time after 15 years of age nearly 10 per cent. develop manifest tuberculosis, a frequency exceeding that in the general population to much the same extent as that among child contacts in contrast with the children of healthy families. Throughout these studies a clear distinction is drawn between findings in whites and negroes; the different behaviour of the disease in coloured races is hence no reason for refusing to apply their conclusions to any white population.

The authors would have us recognise that pulmonary tuberculosis is an infectious disease, differing from other infectious diseases and concealing its real nature only by the fact that its incubation period is often reckoned in years. Those concerned with the care of the tuberculous should study these papers carefully; it is much to be hoped that similar studies may be pursued in this country by those to whom the opportunity is available.

CATGUT AND TETANUS

SEVERAL cases have recently been reported in this country of tetanus following surgical operation in which catgut has been used as a ligature material, and the question has arisen whether the catgut may not have been the source of infection. The Therapeutic Substances Regulations of 1931 placed the commercial production of sterilised gut under expert control by the Ministry of Health, and since then the risk of non-sterile catgut reaching the hands of surgeons is lessened, if it has not been actually eliminated. An American investigation¹ has suggested that catgut, prepared by commercial firms in several countries of the world, is still often non-sterile. It seems fairly clear, however, that such British material as was used in this investigation dates from the period before the application of Government control. But this control only applies to catgut as it is offered for sale and not to gut prepared in hospitals or by surgeons for use in institutions or private work. From the discussion (see p. 366) last week at the Royal Society of Medicine it is evident that grave risk is being run from the use of catgut prepared under inadequate control. The dry unsterilised gut, used as raw material by some of the smaller hospitals which prepare their own ligatures, teems with micro-organisms—anaerobes and aerobes with their spores—to deal with which demands efficient processes of sterilisation, scientific rather than traditional. As W. Bulloch showed in 1929 it is possible under ideal conditions of manufacture, with the use of heat and certain chemical substances, to prepare catgut which satisfies routine bacteriological investigation. Whether such material will still be proved sterile after it has been subjected to digestion in the tissues remains to be seen; but the clinical experience of hundreds of surgeons, in thousands of cases where standard commercial catgut has been used, suggests that the risk is extremely small. What has been done so successfully in some hospitals should be feasible in others, and the time has come when the sterility of every brand of catgut used by surgeons should

be controlled by standardised investigation. It is urgently necessary that some cheap and efficient method of sterilisation should be placed in the hands of the smaller hospitals and private surgeons who sterilise their own catgut, which, if rigidly followed, would remove a risk which, if numerically small, is yet a very terrible one. Where catgut is employed, as it generally is, because it is absorbed by the tissues, obviously the interior of the catgut must be as sterile as the exterior; and digestion methods in the bacteriological laboratory afford the only means of checking this. When delayed absorption is the aim the surgeon should satisfy himself that the 20, 40, and 60-day catgut is really absorbed within a few days of the time specified on the containers.

A REMEDY FOR VAGINAL INFECTIONS

DEVEGAN is the manufacturers' name for a combination of 4-oxy-3-acetyl-amino-phenyl-arsinic acid with boric acid in a carbohydrate vehicle. The arsenical constituent is, therefore, identical with the arsenical derivatives, Stovarsol, Spirocid, and Orarsan, which are widely used in the oral therapy of syphilis. The compound is made in the form of tablets for insertion into the vagina and for some time has been available to the medical profession in this country. The advantages claimed by German writers are that it causes vaginal discharges—particularly those associated with the flagellate protozoön *Trichomonas vaginalis*—to diminish in satisfactory and often remarkable fashion; and that much inconvenience and expense are saved to patients owing to the ease with which self-treatment can be carried out. The unpleasant and sometimes harmful practice of regular vaginal douching can thus be dispensed with.

It is inevitable that a new preparation which is relatively inexpensive and easy of application and produces a fair proportion of excellent results should be employed somewhat indiscriminately when its advantages are first appreciated. Accordingly, it is useful to have Hauptstein's¹ review of results in 185 cases of vaginal discharge treated with devegan at the gynaecological clinic of the University of Freiburg (Breisgau) during 1933-34. By far the best results, he says, were obtained in those whom it was possible to treat as in-patients; among out-patients the results were less encouraging, while the effects of self-treatment at home were regarded as quite unsatisfactory—a result attributed to lack of coöperation. As many as 48 per cent. of this last group failed to remain under observation and it was decided not to proceed with the investigation in this series. Among in-patients, the procedure adopted varied according to the severity of the infection and the amount of discharge. All self-douching was prohibited. Where conspicuous inflammatory changes of the vagina wall were noted the earlier insertions of devegan were preceded by vaginal douche of silver nitrate 3-5 per cent. or 1 per cent. corrosive sublimate, or both, and this was continued until the local condition showed improvement. One to four tablets of devegan were inserted high in the vaginal fornices, at first twice daily (if this was considered necessary), and then at lengthening intervals until finally the treatment was given just after the menstrual periods only. In more than two-thirds of the cases the desired result was produced within two weeks to two months. Some patients complained of the thick unpleasant discharge of unaltered masses of devegan, but this difficulty was overcome by the insertion of vaginal plugs of cotton-

¹ Clock, R. O.; Surg., Gyn., and Obst., 1934, lix., 899.

¹ Hauptstein, P.; Med. Welt., Dec. 21st, 1935, p. 1845.

wool, which the patients themselves could remove after 24–36 hours. The criteria of success were the absence of recurrence of discharge long after discontinuance of the treatment, the absence of the trichomonas flagellate on microscopic examination of the vaginal secretion after menstruation, and the presence of normal vaginal flora including the lactic acid bacillus. Impressions of the treatment were definitely favourable, both in trichomonas infections and those which were believed to be non-specific. Complete disappearance of discharge or substantial improvement occurred in all but a small proportion of cases (about 8 per cent. of the trichomonas infections and about 4 per cent. of the non-specific). Hauptstein regards the results as definitely superior to those obtained with the various antiseptic douches formerly in vogue, and he puts down relapses and partial failures to irregular attendances or indiscretions on the part of the patients, though the possibility of residual infection in urethra, rectum, or uterus, causing reinfection, is mentioned. A small number of patients showed toxic symptoms which were believed to be the result of the treatment: in 1 case there was nausea, in 9 there was local discomfort or pain of an itching and burning type, and in 1 there was œdema of the labia.

In this survey no mention is made of gonococcal infections, and it should be emphasised that there is as yet no evidence that devegan is effective in eradicating the gonococcus from its usual haunts. The practice of applying this treatment before full investigation to exclude gonococcal infection has been carried out must be condemned unreservedly, since it is likely to make the subsequent isolation of the causative organism difficult or impossible. Moreover, it should be noted that the method of self-treatment is usually unsatisfactory, even where the coöperation of the patient is assured, because of the mechanical difficulty of placing the tablets high in the vaginal fornices. Dr. Collis,² who reports from Birmingham that all but 7 of 47 patients were clear of trichomonas infection after three months—and 5 of the 7 had an associated gonorrhœa—points out that “all the patients were treated at the clinic as it was found that the tablets were more effectively inserted by an experienced person.”

ANÆSTHETICS IN THORACIC SURGERY

Nor many years ago lobectomy was a rare operation only to be witnessed at special chest hospitals. It is now a commonplace in these institutions and is likely before long to be included in the routine list of operations performed at large general hospitals. In an address to the section of anæsthetics of the Royal Society of Medicine on Feb. 7th Dr. I. W. Magill commented on the diversity of methods of securing anæsthesia for this operation. His own preference appears to be for cyclopropane, although this is admittedly contra-indicated when diathermy is used, and for spinal analgesia, the advantage of which according to Dr. Magill is becoming more and more obvious in thoracic surgery. The fear that respiratory paralysis may supervene when spinal anæsthesia is administered to patients with already limited respiratory capacity is apparently not confirmed by clinical experience. No doubt, said Dr. Magill, the explanation lies in the fact that the motor roots are so much less affected by the injection than the sensory that good analgesia is obtainable without corresponding depression of respiratory

movement. This explanation was accepted by Dr. Langton Hewer, who in the course of the discussion voiced his general preference for nitrous oxide and oxygen which does not, he claimed, imply cyanosis. He recommends in severe chest operations the early insertion of a rectal tube through which glucose should be given towards the close of the operation. Dr. Magill disapproves of premedication by any drugs with prolonged action. He employs some of the barbiturates, which are quickly metabolised, and believes that one will still be discovered better than any yet available. In many of the thoracic operations it is necessary to employ suction of the bronchi in association with intubation, and it is often a great advantage to block off other portions of the lung. He showed an ingenious apparatus which he has devised and uses for this purpose. Mr. J. E. H. Roberts thought that diathermy was almost essential in lobectomy and precluded the use of any inflammable anæsthetic. He did not like nasal intubation, and he drew attention to the very small amount of lung with which respiration could be effectively performed. Mr. H. P. Nelson likes cyclopropane for the quiet respiration it secures in the patient, but a disadvantage is that it increases the bleeding. In his view cyclopropane seems to lead the field for mediastinal dissections.

FOR THOSE ABOUT TO MARRY

THE scheme for voluntary prenuptial health examinations issued by the Eugenics Society this week¹ is constructed on such a broad foundation that it may well develop into a service of national importance. The scheme differs from those established in certain European countries in many respects, of which the most important is that it is designed only for those who themselves seek information and advice before contemplating marriage and indeed could not be worked on a compulsory basis. Moreover, the examination is not intended solely to serve the purpose of preventing dysgenic marriages or of checking the fertility of undesirable stocks—it has the further aim of improving the prospects of a successful and happy marriage. The distinguishing features of the scheme are that the applicant deals only with a doctor of his choice, through whom alone he can receive the schedules to be filled up. If the doctor is in doubt about the significance to be attached to the answers to the questions, or to his own findings on physical examination, he can seek the opinion of a consultant; or if it is a problem of heredity that puzzles him the Eugenics Society will be prepared to help in its solution through the good offices of a board of specialists. It is recognised that some doctors who are especially interested in the subject will have formulated their own questions and methods of physical examination. But in view of the infrequency of the demand hitherto it is likely that others may have little experience of such examinations and may be glad to use the pattern of premarital health schedule here provided.

It consists of three parts of which the first relates to the applicant's family history—notably consanguinity of proposed partners, the ages and causes of death of near relatives, and, more important, the incidence in near and distant relatives of diseases and defects (specified) which are thought to be hereditary. The second part of the schedule is divided into three sections, A, B, and C, in which questions are asked about (A) physical diseases, (B) psychological abnormalities, and (C) sexual

² Collis, J. L.: Jour. Obst. and Gyn. Brit. Emp., February, 1936, p. 87.

¹ Obtainable from the general secretary of the society at 69, Eccleston-square, London, S.W.1.

problems. The questions on physical diseases have been framed in accordance with the experience of insurance companies; those on possible nervous troubles bear the stamp of wise psychological advice; while the third section is skillfully planned to enable the applicant to indicate the sexual problems preoccupying him by the simple deletion of the words yes or no in answer to non-committal questions. These questions should cause little or no embarrassment to those who, having become engaged, develop anxiety about their future sex life which makes them highly sensitive to any direct attempt to probe their difficulties. A quiet chat some time after they have said "yes" to any such general question as whether the subject of sex is at all repugnant or whether there are any worries about past or future sex life that they would like to discuss, is likely to do much to reassure them. The third part of the schedule—giving space for results of physical examination—is in the form of leaves that can be used separately and should be retained by the doctor, with some confidential notes for his guidance. He is reminded that among the reasons for which a health examination may be sought before marriage are: the anxiety of parents; misgivings about hereditary diseases or defects; present abnormalities such as heart disease, glycosuria, and so forth; past diseases, often venereal; desire for specific reassurance of a general nature; and desire to break an engagement. Most doctors have had experience of the neurotic who develops ailments which serve the purpose of postponing a marriage which is not really desired. A man has even been known to ask to be examined and to draw attention to some real or imaginary disability in order to get out of an action for breach of promise.

It is clear that the Eugenics Society in issuing these schedules is in no way trying to override the functions of the practitioner, who is in fact made the central agency through whom they will be distributed. The society will not communicate with individual applicants and indeed will come into the picture only when its help is needed on a genetic problem. We believe that family doctors who have not hitherto given much attention to these problems will welcome assistance in dealing with them.

THE ACTION OF POSTERIOR PITUITARY ON THE COLON

In 1909 the late Prof. Blair-Bell observed violent peristalsis and expulsion of faeces in rabbits after pituitary extract had been injected intravenously, and recommended its use in man in conditions of intestinal stasis. It has since been widely employed in clinical practice. Further observations on animals, however, threw doubt on its power of increasing intestinal movements, and in the intact unanaesthetised dog it seems clear that movements are inhibited.¹ Since the separation of pituitary extract into "pitressin" and "pitocin" it has been suggested that many of these discordant results may be due to a difference in the actions of the two principles on different animals. In this connexion observations on the action of pitressin and pitocin on the human colon are of especial interest. Macdonald and Settle² have recently studied the action of the separated principles by inserting a balloon into the proximal colon of patients with colostomies. Intra-

venous injection of 1–2 units of pitressin were found to produce peristalsis in 2–3 minutes, usually accompanied by loss of faeces or flatus. Pitocin was usually ineffective, but it did not inhibit the action of pitressin as it does in dogs.³ Similar results were obtained when the drugs were given while X ray examinations were being made. It is noteworthy that subcutaneous or intramuscular administration of pitressin gave a response which was always delayed, and often feeble in intensity, and this raises a point of practical importance. Pitressin has been shown to cause constriction of the coronary vessels,⁴ and if administered indiscriminately might well give rise to dangerous reactions. On the other hand experience seems to show that pituitary extract given intramuscularly is usually clinically satisfactory in the treatment of post-operative intestinal distension, or where it is desired to remove gas from the colon preparatory to X ray examination of the renal tract. It would nevertheless be of interest if alternative drugs for this purpose, such as eserine,⁵ Prostigmin,⁶ prostigmin plus pituitrin,⁶ or acetylcholine⁷ were more widely used and reported upon, so that their relative merits could be more fully assessed.

Sir Thomas Barlow has been elected a member of the French Academy of Medicine.

THERE is universal sympathy with Sir Humphry and Lady Rolleston in the tragic death of their only remaining son during an *émeute* in Zanzibar. The feeling will be specially present in the medical profession, where Sir Humphry Rolleston, in private as well as in many important public positions, is regarded with such real respect and affection.

ON Feb. 17th and 26th and March 2nd the Lettsomian lectures of the Medical Society of London will be delivered by Dr. Philip Manson-Bahr in the Society's house in Chandos-street at 9 P.M. He will speak on the differential diagnosis of diseases of the colon (dysentery and colitis) and their complications.

Sir Herbert Cooke, whose death occurred on Feb. 6th in St. George's Hospital as the result of an accident, was a distinguished soldier with a great Indian record behind him. Also he was a practical philanthropist and a worker in an important medical cause. Retired as a lieutenant-general while still comparatively young and full of energy, he adopted as a hobby the London Children's Gardens Fund and during his connexion with the movement secured a greatly increased support for the valuable project of securing for London's poorest slum children the joy of possessing a garden, and in this work he found the health of the children an efficient argument for soliciting support. Recently he had taken charge of the activities for securing the money for the rebuilding of St. George's Hospital, and his work had already borne fruit, the results of his capacity and ingenuity in planning becoming evident. He regarded that work as only initial to larger developments, and his sudden death is a great loss to a charitable cause into which he had thrown himself with enthusiasm.

¹ Elmer, A. W., and Ptaszek, L.: Compt. rend. Soc. de biol., 1930, civ., 540.

² Goldenberg, M., and Rothberger, C. J.: Zeits. f. ges. exper. Med., 1931, lxxvi., 1.

³ Cannon, W. B., and Murphy, F. T.: Jour. Amer. Med. Assoc., 1907, xlix., 840.

⁴ Carmichael, E. A., Fraser, F. R., McKelvey, D., and Wilkie, D. P. D.: THE LANCET, 1934, i., 943.

⁷ Abel, A. L.: Ibid., 1933, ii., 1247.

¹ Gruber, C. M., and Robinson, P. I.: Jour. Pharmacol., 1929, xxxvi., 203.

² Macdonald, A. D., and Settle, H. L.: Jour. of Physiol., 1936, lxxxvi., 8 P.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXXXVIII.—PROGNOSIS OF FRACTURES OF THE UPPER END OF THE FEMUR

FRACTURE of the upper end of the femur is frequently followed, within a few weeks or months, by the death of the patient. Of 615 patients who were admitted during twenty years to Lambeth Hospital 166 died without leaving the hospital, and of the remainder a large number were left with a disability that materially reduced their enjoyment of life. This high mortality and grave disability is, however, not so much due to the injury itself as to the fact that it is an injury that occurs much more frequently among the old than the young, among the feeble than the strong. The average age of the patients mentioned above was 69 years, and in many cases the fracture was an incident in their final illness, hastening the end little, if at all.

Factors to be Considered

In giving a prognosis in any particular case several factors must be considered.

AGE OF THE PATIENT

The older the patient the more chance there is of death occurring directly as a result of the injury. Old people are much less able to put up with the discomforts attendant upon the treatment of even minor injuries than are the young, and any attempt to submit them to an unpleasant régime may bring about fatal complications.

CARDIOVASCULAR DISEASE

A large number of patients who sustain this injury are suffering from cardiovascular disease, and many of them have had a cerebral thrombosis or other disabling complication. Indeed the reason why this fracture mainly occurs late in life is because it can only happen when bones have been rendered brittle and muscles have lost their tone. It is for this reason that the mortality of the injury is so high. In this connexion it is interesting to note that there are two different periods after the fracture at which death tends to occur in feeble patients: (1) those who die within about fourteen days, being unable to adapt themselves to the altered circumstances which the injury produces; and (2) those who live for eight or ten weeks and make an apparent recovery only to die when the first attempt is made to get them out of bed. In the latter group are patients whose hearts are only strong enough to keep them alive when at rest and are unable to stand the strain of movement. A large proportion of patients who die after this injury fall into this second class.

SITUATION OF THE FRACTURE

For the purposes of prognosis only three situations need be considered: (a) fracture through the neck; (b) fracture through the great trochanter; (c) fracture immediately below both trochanters. As regards mortality there is little difference between these three situations. Among the above-mentioned 615 patients, 24.5 per cent. of the fractures of the neck, 29.3 per cent. of the fractures through the great trochanter, and 25 per cent. of the sub-trochanteric fractures died without leaving hospital, but there is a great difference between the prognosis of the three types in regard to functional results.

Fractures through the neck, when they occur in young people or in people who are healthy enough to undergo severe operations or prolonged and trying treatment, have a very good chance of getting bony union in moderately satisfactory positions and of being restored to almost full functional use of the limb. Treatment by a Whitman's plaster without open operation but with manipulation under an anæsthetic, or by the insertion of a Smith-Petersen's pin, the position of the fragments being determined by open operation, both give good results in the hands of experienced workers. It is probable that Whitman's method is applicable to a larger number of patients but Smith-Petersen's pin shortens somewhat the time during which treatment is necessary. For those who are unable to stand either of these methods of treatment a strong fibrous union can generally be secured by fixing the patient on an extension frame with both lower limbs suspended and widely abducted. If this position be retained, without interruption, for ten weeks a firm fibrous union will form and the patient can then walk about with the help of a calliper splint, which should be worn for a period of one or two years. Movements of the hip in these patients with fibrous union are generally painless over a very small range of movement, but cause pain when the patient is fatigued or when any extended range of movement is attempted.

Fractures through the great trochanter, while having the same mortality as fractures of the neck for reasons given above, should cause very much less disability if they are properly treated. They practically never fail to join firmly by bony union, and if properly disimpacted and placed in good position in an extension frame with both legs abducted the union will generally be firm in eight weeks, and the patient afterwards will walk with but little disability. If the fracture is firmly impacted and the patient is very feeble it is sometimes tempting to allow the impaction to remain, with the bones in bad position, and to let the patient walk about as best he can within two or three weeks of the fracture. Such a method is sometimes, though rarely, successful; more often the patient's disability is so great that his feebleness is increased by the added effort of moving with a deformed limb. It is probably always better to disimpact if it is at all possible to give the patient an anæsthetic. The operation should never be done without an anæsthetic.

Sub-trochanteric fractures occur in patients whose bones are unusually brittle, and frequently in those bones which are the seat of neoplasm. The prognosis in this case is that of the disease and not of the fracture.

THE TIME WHEN TREATMENT IS FIRST APPLIED

To get the best results in fractures of the femur the patient must be cared for by skilled nurses with experience in this class of injury. Unless steps are taken to reduce deformity, and to secure such apposition of the fragments as is possible, within about forty-eight hours of the fracture, there is little likelihood of a good result being obtained. During the first two or three days after the fracture there is a great danger that the feeble patient may be worn out by pain and acquire bedsores, thus preventing subsequent effective treatment. It is surprising with what rapidity bedsores may form during the

first few hours in these cases, and the best way to prevent them is to apply, as a first aid, a simple axial extension by means of a Buck's stirrup to both legs and to place them on a frame by a counterpoise, thus lifting part of the weight of the helpless limbs off the bed. The practice of placing the damaged limb between sandbags as a first-aid measure cannot be too strongly condemned; the only effect of such sandbags is to make sure that any movement of the

patient's body, occurring while the leg is held still, will take place at the site of the fracture, causing pain to the patient and further laceration of the damaged tissues, and materially lessening the prospect of a satisfactory recovery.

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SPECIAL ARTICLES

TEA AND COFFEE

A PHARMACOLOGICAL DISCUSSION

At a combined meeting of the Society of Public Analysts and other Analytical Chemists with the Society of Chemical Industry (Food Group), held at the Chemical Societies Rooms, Burlington House, Piccadilly, on Feb. 5th, the chair being occupied by Mr. JOHN EVANS, M.Sc., F.I.C., president of the first-named society, a discussion on tea and coffee, with special reference to their tannins and alkaloid, was opened by Dr. G. ROCHE LYNCH, analyst to the Home Office. It was, he said, generally assumed that the pharmacology of tea and coffee could be stated in terms of caffeine—which he very much doubted. He understood it to be agreed that tea contained, on the average, $2\frac{1}{2}$ – $4\frac{1}{2}$ per cent. of caffeine, and coffee 0.5–1.5 per cent. of caffeine. The action of caffeine on the body could be divided into three groups: its effect on the central nervous system, its action on muscular tissue (including heart muscle and that controlling the intestines), and its diuretic action or promotion of the flow of urine.

THREEFOLD ACTION OF CAFFEINE

The action of caffeine on the *central nervous system* was almost entirely in the form of a psychological function, i.e., on the higher centres of the brain. If it were taken in toxic doses, it might exert an effect on the spinal cord similar to that of strychnine, namely, in producing convulsions. In the course of its action on the central nervous system caffeine facilitated the perception of sensory stimuli and the association of ideas, so that consciousness became, under its influence, more acute. One of the results of that was a condition of wakefulness or increased alertness, and so any tendency to drowsiness or fatigue was made to disappear or was much less pronounced. A corollary to this was that interpretations of sensory stimuli received by the brain from various external sources became more perfect and accurate. Even more important was the fact that these stimuli were correctly placed in relation to each other. In this latter respect there was a profound difference between the effect of caffeine and that of cocaine, for in the case of the latter, in addition to the increased perception of the higher centres, enhanced impressions from the lower centres were also received, and the impressions were not so perfect as in the case of caffeine. Thus with cocaine the tendency was for the judgment to be impaired; with caffeine the accuracy of the judgment was enhanced. Caffeine also caused a constriction of the musculature of the blood-vessels, leading to a rise in blood pressure, and respiration was stimulated. The centres controlling these functions were situated in the lower part of the brain, and that

was an additional fact in the pharmacology of caffeine. If a person took a very large dose of caffeine, the process just described was intensified, and the result was a confusion of thought, and disorders of sensation, which were associated with flashes of light in the eyes and noises in the ears, so-called tinnitus. If extreme doses were given, this excitation proceeded to restlessness and the receiver became tremulous, and might develop convulsions, as followed strychnine poisoning.

With regard to the action on *muscle tissue*, he reminded his hearers that from the medical point of view muscle was divided into three kinds: voluntary muscle, the working of which was controlled by the will; cardiac muscle, a specialised form; and the involuntary muscle, such as that in the intestines and the blood-vessels, not under the immediate control of the will. Although not definitely known, it was believed that caffeine acted directly on the muscle-cells, not on the nerve-cells; and the muscular work performed by the person taking caffeine could be increased without that person feeling fatigued in corresponding degree. Here arose a difficulty, as it was impossible to say whether or not the abolition of the feeling of fatigue was due to an effect of the drug on the muscles or on the central nervous system. As would be expected from what he had said, caffeine was a factor in producing contraction of blood-vessels and intestines, and their more vigorous action. There occurred also in those who had taken caffeine a general acceleration of the heart beat, with a diminution of the diastolic period; hence if the dose were large over a period of time the effect on the heart might be definitely unfavourable. In ordinary medicinal doses, however, the taking of caffeine seemed to have no deleterious effect. The cardiac state after taking large doses of the drug may take the form of auricular fibrillation. Conceivably this might lead to death, though actually death from caffeine is very rare.

With regard to the *diuretic action* of caffeine, the increased flow of urine promoted by it was due to a greater output of water, so that the urine itself became more dilute than normal; but tested over an appreciable period, there was found to be, not only an increase in the total urinary output, but also in the total solids passed. This elimination of water was among the valuable results of the medicinal use of caffeine, as seen in patients who were suffering from dropsy, hence the special value of the drug in heart failure or of kidney disease. This increased elimination of water was found to be partly due to the raised blood pressure, and partly to the specific action of the caffeine on the cells of the kidney, enabling them to excrete water and, to some extent, solids too, in greater amount. Some of the caffeine is decomposed in the body, some excreted in the urine in an unchanged condition, and some in a partly de-methylated form, i.e., mono- or di-methyl xanthine (caffeine is trimethyl xanthine).

OVERDOSE. ADDICTION. SLEEPLESSNESS

Dr. Roche Lynch said he had not yet encountered a case in which death was definitely caused by an overdose of caffeine. As much as grs. 60 of the drug had been taken at a time, but the serious illness which immediately resulted was recovered from. After taking very large doses of caffeine the person manifested the form of excitation which may be seen in people drunk from alcohol; dizziness, a ringing and buzzing in the ears, trembling, sleeplessness, confusion of ideas, delirium, palpitation of the heart, and even strychnine-like convulsions.

He did not consider that caffeine could be included in the drugs which came under the heading of addiction. People who took it in the form of coffee and tea became accustomed to it, and as they looked forward to it and liked it they found it difficult to do without it. Still, as opposed to the case of cocaine and morphine, it could be given up without much mental effort or feeling of loss, and its indulgence did not cause the serious train of symptoms which followed the habitual taking of cocaine and morphine. In post-mortem examinations he did not believe that any changes in the stomach and intestines occurred in those who had drunk largely of the beverages tea and coffee that could be associated with such drinking. He knew of no cases warranting the suggestion that either caffeine or the tannin could produce such an effect.

With regard to sleeplessness, he felt himself to be in somewhat of a difficulty, and he invited suggestions. All must know people who said they dare not take coffee after dinner, as it would keep them awake half the night; some said they always took a cup of tea instead, while others said that if they wished to do writing late at night this was made easier by taking a cup of tea. On the other hand, when people had narcotic poisoning, coffee administered per rectum was a common remedy employed. That the association of these beverages and sleeplessness may be largely psychical was suggested by the fact that in many cases if one gave caffeine citrate in a medicine unknown to the patient, there was often no interference with his sleep. Though he had pointed out various attributes of caffeine, such as increased stimulation, he felt there must be some further factor in the beverages under discussion which had definite effects in regard to sleep, but which at present could only be conjectured.

TANNIN IN TEA

In a paper on the tannin-content of tea, by Mr. P. J. NORMAN, F.I.C., and Mr. E. B. HUGHES, D.Sc., F.I.C., the authors referred to the lack of knowledge of the exact nature of tea-tannin, and for this reason they had made comparative extractions of tea-tannin by the more important of the methods employed. They pointed out that tannin is present in all tea, that it is an important constituent in that it contributes largely to those properties which characterise the quality of tea, and that there is more tannin in good leaf than in poor leaf and less in stalk than in leaf. The methods used for the comparative analyses were:—

1. Cinchonine precipitation of the tannin;
2. The Löwenthal method of oxidation of the tannin by potassium permanganate; and
3. The hide-powder method.

Results obtained showed that teas of the same class could be compared, as regards tannin-content, by any one of these methods, but that there was some difference in results by the three methods for any one tea, this depending on whether the tea was a

black (fully fermented) tea such as Indian, Ceylon, China, &c., or a green (unfermented) tea (little drunk in this country), or Oolong (lightly fermented) tea. There was also some difference among black (Indian and Ceylon) teas which the authors considered to be due to the grading (by fineness) of the tea. Results were given for a large number of unblended teas of known origin, varying from 10 to 17 per cent. of the dry tea for black teas, and 9 to 15 per cent. for green and Oolong teas. The authors had also determined the tannin-content of a number of teas sold to the public as "digestive," "invalid," &c., teas; these were found to have the same tannin-content as the ordinary commercial teas of the same class (black teas of Indian, Ceylon, China, &c.). It was pointed out that infusions of tea, as ordinarily prepared for drinking, contain about two-thirds of the tannin from Indian or Ceylon tea and about one-half of the tannin from China tea.

COFFEE EXTRACT

Mr. EDWARD HINKS, B.Sc., F.I.C., read a paper on coffee extracts. A considerable proportion of the fluid consumed in this country as coffee must, he said, be reconstituted from coffee extract. The proper criterion of the value of an extract was, he thought, that its composition when reformed or reconstituted should be as close as possible to that obtained from the native article, a parallel case being condensed or dried milk in comparison with liquid cow's milk; the loss should be only that inseparable from the processes of drying or condensing. His experience was that extracts purporting to be pure coffee were comparatively rare, coffee and chicory extracts being the commoner. But judging from the samples he had received the caffeine in the two classes did not differ much, the coffee extracts (12 in number) containing from 0.1 to 0.33 per cent. of caffeine (average 0.21), and the 45 coffee and chicory extracts containing from 0.05 to 0.38 per cent. (average 0.19), though there might be some doubt about the designation of some of the coffee extracts. A dry extract he had examined contained 6.8 per cent. of caffeine. Taking the caffeine as a basis of evaluation, the poorest extracts gave a "coffee" only of from one-tenth to one-fifth the strength of ordinary breakfast coffee made from the berry and even at the best they were but a poor approach to the real article. Why then did these beverages look so much like coffee? It appeared to be due to the use of caramel. A comparison of the costs, again on the basis of caffeine, gave some humorous results. In pure coffee at 2s. 6d. per lb. a "unit" of caffeine cost 7d.; in the dry extract it was 6.2d.; in a "0.22 per cent." coffee extract it was 28d., and in a "0.1 per cent." coffee and chicory extract it was found to be 41d.

UNSUPPORTED CLAIMS

Mr. AINSWORTH MITCHELL, D.Sc., F.I.C., read a communication from Mr. H. H. BAGNALL, B.Sc., F.I.C., city analyst of Birmingham, in which he spoke of the results of his analyses of a number of packet teas whose wrappers bore various claims, mainly in the direction of preventing or curing digestive disorders because of the absence from the teas of tannin. In every case those claims were unsupported by scientific fact. In the alleged tannin-free teas he found from 9.9 to 16.4 per cent. of tannin, the average of a series being 12.5 per cent. Two China teas contained 8.6 per cent. of tannin. One brand of tea was stated to contain only the tips of leaves and therefore to be tanninless; it had the average quantity of tannin and was ground fine to give the

idea of tips. One brand was stated to be curative because of the large vitamin content, but it had only a trace of one vitamin—namely, E. In many cases a representation to the firms of the error in the claims made resulted in modification of the wording on the packets.

Mr. A. L. BACHARACH, M.A., F.I.C., asked whether caffeine could be regarded as a cumulative poison, and if so, was it cumulative because it was stored and then gradually used by the body, or because its adverse effect on certain organs continued for a considerable time?

Mr. H. H. MANN, D.Sc., F.I.C., assistant director of the Woburn Experimental Station, remarking that he had been connected with the tea industry for 36 years, said there was no relationship between the price paid for tea and its caffeine content. Other things being equal, teas of high tannin-content were generally superior. Taste was an important factor in the choice of teas, and he thought an investigation should be made into the different forms of tannin which tea contained before dogmatic statements could be made about its effect on quality.

Mr. L. H. LAMPITT, D.Sc., F.I.C., agreed with Dr. Mann about the importance of taste. In making claims that their teas were tannin-free the proprietors of some packet teas were no doubt playing up to the public imagination of tanning the stomach. Dr. Roche Lynch, he recalled, could find no post-mortem evidence of stomach tanning.

Dr. ROCHE LYNCH, in a brief reply, said that any cumulative effect of caffeine might have been not from storage, as it was quickly broken down in the body.

VIENNA

(FROM OUR OWN CORRESPONDENT)

DEATHS IN THE PROFESSION

THE University of Vienna has had a serious loss in the deaths of Prof. Maresch and Prof. Bruno Busson. The former, who died of bronchial cancer at the age of 68, first worked at the institutes of anatomy and pathology in Prague. When he came to Vienna he began to study surgery and gynaecology but he soon forsook them for morbid anatomy. He was chief pathologist at the Rudolfs-spital and also in the Municipal Hospital. He was appointed a lecturer by the university in 1910 and in 1923 succeeded Paltauf in the chair of morbid anatomy, which he held till his death. His early work was on the epithelial bodies and the histology of the kidney, and his staining methods were unique; he devoted his later researches to the problems of the internal secretions. His institute contains a splendid museum which is chiefly the result of his own work. He was an excellent teacher, and as an authority on morbid anatomy his reputation was international. Busson was director of the federal Serotherapeutic Institute, which controls all the vaccines and sera used in Austria. He graduated here and studied hygiene and bacteriology in Graz and Paris. During the late war he was in charge of the Health Commission and was responsible for the comparative freedom from war epidemics at the front and in the hinterland. His work was mainly concerned with immunity and experimental medicine especially with tetanus and diphtheria.

THE FIRST AID SOCIETY IN 1935

The ambulance corps here, which served as a model for the others in Europe, has dealt in the past

year with 26,134 emergencies, an average of 72 daily. The proportion of injuries to sudden illness, three to two, has remained constant for about eight years. There were 3112 traffic accidents; 1775 of these were due to motor-cars, 757 to pedal cycles, 419 to tramcars, 111 to horse-driven vehicles, and 50 to railway accidents. Sport and athletics were responsible for 725 casualties, 414 persons were bitten by animals, and 1685 were injured in factories. Members of the society also attended 391 women in precipitate labour, 2000 cases of suicide and attempted suicide, 230 of insanity, and 180 of alcoholic excess. The close co-operation of police and hospital staffs with the society ensures an immediate response to emergency; 15 lives, for example, were saved by this efficiency after injuries to the heart by stabbing or shooting; while the patient is being hurried to hospital in an ambulance the surgical staff have already been warned and are prepared to operate at once.

CORONARY OCCLUSION

Dr. N. Landau has recently been speaking on the pathology and treatment of cardiac infarct. In the Vienna Heart Hospital there have been in the last three years 150 cases of sudden coronary occlusion; 80 per cent. of the patients were men, 45 per cent. were aged 55-65, and 30 per cent. aged 45-55; but 8 per cent. were not yet 45 and 2.5 per cent. were under 40. The majority (78 per cent.) had some previous symptoms such as dyspnoea, vertigo, intermittent claudication, or those of hypertension. In 21 per cent. the precise time of onset could not be determined, and neither exercise nor the time of the day seemed to have any influence. The majority had had angina pectoris for about five years but in 4 per cent. it was entirely absent; other symptoms were cold sweats (25 per cent.), dyspnoea (25 per cent.), angor animi (18 per cent.), nausea and vomiting (15 per cent.), and unconsciousness (10 per cent.). In 91 patients brought in with a recent infarct the clinical findings were few; 60 per cent. had weak murmurs, while of the 23 that had a gallop rhythm only 7 survived. An important sign almost constant enough to be considered pathognomonic was a rise of 1-3° C. in the rectal temperature, present in 75 per cent. and remaining for about a month in 30 per cent. Blood pressure was low in 60 per cent. and remained so for several weeks. A tachycardia not affected by digitalis was a bad sign. The electrocardiogram was always abnormal; in 83 per cent. it was characteristic of occlusion of a coronary branch and in 17 per cent. of myocarditis. The mortality was 30 per cent., of whom a third died suddenly, some even in convalescence; the rest died after getting progressively weaker in spite of all treatment.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

TREATMENT OF LUPUS VULGARIS

Dr. Robert Aitken, at last week's meeting of the Edinburgh Medico-Chirurgical Society, reported strikingly good results in the treatment of lupus vulgaris by the use of the Finsen-Lomholt lamp. In the past five years, he said, 0.6 to 1 per cent. of the new cases seen in the skin department of the Royal Infirmary of Edinburgh were cases of lupus vulgaris; fifteen years ago the incidence of this disease was three times as great. He has investigated 310 patients and the face was affected in 77 per cent. of them.

In more than half, the disease began during school life, and it is uncommon for it to commence after middle age. He stressed the frequency with which this condition is associated with tuberculous glands, and said that during the past seven years 116 cases of lupus with tuberculous adenitis were treated at his department. Until recently lupus has been a very intractable disease, and the results of the old forms of treatment were often unsightly. Dr. Aitken condemned, in particular, the end-results of X ray treatment, for the scar of the burn is disfiguring and it often stimulates the development of carcinoma. In his opinion the diminishing incidence of lupus is due to the successful treatment of tuberculous glands with general light baths, without which many would have developed lupus at a later age. The general treatment of lupus necessitates the use of the hygienic and dietetic measures that apply to the treatment of all forms of tuberculosis. Tuberculin is the remedy of choice in the absence of facilities for light treatment. Excision, scraping, and cauterising are all unsatisfactory, and they fail to remove the disease from the deep skin glands; X ray treatment should also be given up. The original Finsen light treatment was satisfactory up to a point, but whereas only 15 per cent. of the radiation energy of this lamp could be applied to the diseased surface the corresponding figures for the new Finsen-Lombolt lamp is 70 per cent. This increase in power has enabled the time required for each treatment to be reduced to no more than one hour, and its convenient construction makes the application much less tiring for the nurse in charge.

Dr. Aitken showed a number of beautiful coloured slides showing that even in an advanced state the disease could usually be cured in about six months. Reports of a large series treated in Vienna from 1914 to 1923 show that the striking results are usually permanent.

GLASGOW ROYAL INFIRMARY

In the 141st annual report of the managers of Glasgow Royal Infirmary it is stated that there were over 18,000 in-patients and 120,000 out-patients during the past year. There has been a deficit on the ordinary account of over £26,000; the extraordinary receipts totalled £62,000, and it was possible to carry £28,000 of this to the capital account. The managers hope that the Canniesburn auxiliary scheme, the foundation-stone of which was laid by the Duke of Kent in May of last year, will be completed by the end of 1936. These buildings will provide 80 beds for patients in early stages of convalescence, together with 40 beds for paying patients of limited means. It is hoped that the provision of these additional buildings will reduce the number of patients awaiting admission to the infirmary.

THE LATE PROF. ASHWORTH

Edinburgh graduates who have enjoyed his teaching will feel that the university has lost one of its outstanding figures by the sudden death of Prof. James Hartley Ashworth, F.R.S., of the chair of natural history. It was because of his important work in invertebrate zoology that large contributions were made to the university for building the new zoological laboratories. He was particularly interested in entomology and protozoology and had conducted a class in this subject in the university since 1905. His life and energies were devoted to his science and to the university, in which he taught for nearly thirty-six years. He was everywhere popular and was always anxious to help his colleagues and his students.

IRELAND

(FROM OUR OWN CORRESPONDENTS)

THE NATIONAL MATERNITY HOSPITAL

The governors of the National Maternity Hospital, Dublin, are engaged in promoting a private Bill with the object of amending their charter, altering the name of their corporation, and effecting other changes in their powers and constitution. The preamble of the Bill has been declared proved and the Bill now lies on the table of the Dáil. The National Maternity Hospital, which is familiarly known as Holles-street Hospital, was founded in 1894 for the relief of poor lying-in women and for the treatment of diseases peculiar to women. In 1903 a charter under the Great Seal of Ireland was issued by King Edward VII., which established the corporation of governors of the hospital, and defined their powers and duties. The hospital has had a very successful career, and having outgrown its old premises, has recently been provided with a new and commodious building from Sweepstake Funds. Up to the present the hospital has been managed by a body of governors co-opted as vacancies occurred. It is now proposed to make several important changes in the constitution, and to bring the hospital into direct relation on the one hand with University College, Dublin; and on the other with certain general clinical hospitals. At present the number of governors is limited to 65, but if the Bill becomes law this limit will be raised to 100. Of these governors 3 shall be nominated by the corporation of Dublin, 2 shall be nominated by the governing body of University College, Dublin, and 1 each shall be elected by the hospital from the staffs of Jervis-street Hospital, the Mater Misericordiæ Hospital, and St. Vincent's Hospital respectively. Provision is made for the appointment of an executive committee and the delegation to it of certain powers. The hospital is to be designated in future "The National Hospital for Women, Dublin." It is provided that the present master (Dr. J. F. Cunningham) shall continue in office until Dec. 31st, 1941.

THE KING'S PROFESSORSHIPS IN THE SCHOOL OF PHYSIC

On Feb. 7th the President and Fellows of the Royal College of Physicians of Ireland elected Dr. David Smyth Torrens to the King's professorship of the institutes of medicine in the School of Physic, Trinity College, Dublin, to fill the vacancy created by the death of Prof. Harold Pringle. Dr. Torrens has been for some time assistant professor of physiology in Trinity College. He was formerly lecturer in zoology in the Royal College of Science, Dublin. At the same meeting the resignation of Dr. Thomas Henry Wilson, King's professor of midwifery since 1910, was received with regret. Dr. Wilson's health has not been good in recent months.

OUTBREAK OF FIRE AT QUEEN'S UNIVERSITY, BELFAST

There was a serious fire at Queen's University, Belfast, on the afternoon of Feb. 7th. The part affected was the medical school, which is a large building situated close to others in the university grounds. The fire began in a storeroom under the anatomy lecture theatre, which is on the second floor. Students were at work in the dissecting-room nearby and on the ground floor a surgical lecture was in progress. So rapid was the spread in the few minutes before the brigade arrived that the building had to be evacuated, dense clouds of smoke pouring

from it. A strong wind was blowing and at one time it seemed as if the fire might spread to involve the whole building; but the efforts of the brigade were soon successful in confining it to the storeroom and the anatomy lecture theatre. Here the fire blazed furiously, the dry wood of the benches igniting readily, and before long flames were seen to be coming through the roof. In about an hour and a half, however, the fire was under control and subdued. It was feared at first that Prof. T. Walmsley's room

and the laboratory in the tower would have been destroyed, but we understand that, apart from damage to the roof, there has been no other serious loss. Directly beneath the fire was the museum which contained a large and valuable collection of anatomical and pathological specimens. Though part of the ceiling was damaged by the fire breaking through in one place, it did not collapse and the contents of the museum were only slightly damaged. The building is now closed and in the hands of the salvage authorities.

CORRESPONDENCE

GASTRIC ACIDITY AND ITS SIGNIFICANCE

To the Editor of THE LANCET

SIR,—Prof. Apperly's paper in your issue of Jan. 4th will have been read by many with interest, as it is both stimulating and provocative. By the time this reaches you I feel sure you that will have received letters from others who can refute from experience some of the assumptions that Prof. Apperly makes from indirect evidence. You may, however, feel that my experience, in another country, is also worth recording.

There must be a mass of evidence on record to contradict the statement that "When the former [the red cell content of the blood] falls to about half or two-thirds normal (on the average) free acid disappears from the stomach." You yourself have made a mild protest against this statement in an annotation in the same issue. I will quote only from a series of my cases that I am at the moment analysing; in a series of fractional gastric analyses on 33 Assam tea-garden coolies whose blood hæmoglobin content ranged from 17 to 45 per cent., mean 32 per cent. (100 per cent. = 13.75 grammes per 100 c.cm.), in 27 the maximum gastric acidity (free) was from 25 to 90 c.cm. of N/10 hydrochloric acid per 100 c.cm., in 2 it was 20 c.cm., in 3 there was free acid but less than 20 c.cm., and in 1 case only was there achlorhydria (histamine not given). In this last case at the beginning of treatment the hæmoglobin was 29 per cent. (4 g.), but it improved to 80 per cent. (11 g.) when a trace of free acid appeared in one sample only (1½ hours) in the fractional gastric analysis.

Though I have always accepted the view that anæmia, per se, may lead to hypochlorhydria or even achlorhydria, recent experience adds very little support to this view; I will cite two cases actually in my wards at the moment: one is a case of hyperchlorhydria (maximum 75 c.cm. N/10 HCl) with 2.75 g. of hæmoglobin (20 per cent.), and the other a case of hypochlorhydric microcytic anæmia in which, though the hæmoglobin increased from 2.47 to 16.00 g. in three months, the maximum hydrochloric acid concentration only increased from 12 to 14 c.cm.

None of our experience in this country suggests that gastric acidity is diminished in a hot climate. The normal gastric acidity is higher than that usually recorded in England and North America (Napier and Gupta: *Indian Jour. Med. Res.*, 1935, xxiii., 455). There are of course other factors to be considered, but all Indians do not live on the traditional highly spiced diet, nor is the evidence conclusive that a highly spiced diet leads to permanent hyperchlorhydria; it may lead to gastritis, the final result of which is hypochlorhydria or even achlorhydria.

Regarding the gastric acidity in asthma, there are many references in the literature (e.g., Hurst: *Brit. Med. Jour.*, 1930, i., 1138; and Bray: "Recent

Advances in Allergy," London, 1931), and it is generally claimed that the acidity is lowered; we (Dharmendra and Napier: *Indian Med. Gaz.*, 1935, lxx., 301), however, found it increased; but admittedly our cases were not true allergic asthma nor was the analysis done at the time of an attack.

I am, Sir, yours faithfully,

L. EVERARD NAPIER, M.R.C.P. Lond.,
Professor of Tropical Medicine.

School of Tropical Medicine, Calcutta, Jan. 31st.

FAMILIAL CIRRHOSIS AND TELANGIECTASIA

To the Editor of THE LANCET

SIR,—I was much interested in Dr. Parkes Weber's paper on the familial tendency to development of hepatic cirrhosis and more especially in his reference to the relationship between cirrhosis and telangiectasia of the Osler type. As Dr. Weber points out there have been many valuable papers on this disease, particularly by H. I. Goldstein, but it is remarkable how few members of the profession are familiar with the condition. In a letter to THE LANCET (1933, i., 116) Goldstein said that there are "probably recorded to date about 110 or 120 families and about 700 persons suffering from Rendu-Osler-Weber's disease (heredofamilial epistaxis with or without familial hæmorrhagic telangiectasia) in the entire available medical literature of the world." When one considers that Osler's original paper was written in 1901 (and a family showing epistaxis was described by Babington in 1865) and, further, that cases have been reported from all over the world, these figures are undoubtedly very small if they truly represent the incidence of this disease. From personal experience I have thought for some time that the figures must be fictitiously low. During the past six years I have personally observed 10 families suffering from this disease, including in their number 56 affected persons; all these people live in the West Riding of Yorkshire and as far as I have been able to trace them the families are unrelated and have not been previously recorded. The wealth of clinical material in Leeds is certainly remarkable, but it is very unlikely that about 10 per cent. of all the cases of familial telangiectasia in the world are living in the West Riding. A considerable number of my cases have shown that the profession as a whole is unfamiliar with the condition and though several of the patients have been transferred to me by Dr. J. T. Ingram, others have come as cases of anæmia of unknown origin, epistaxis, and even headache.

The association of telangiectasia with hepatic cirrhosis is of great interest and I agree with Dr. Weber that the telangiectasia is probably a congenital-developmental dysplasia of the small blood-vessels, and that the cirrhosis may be the result of associated developmental dysbiotrophy of the liver. At the same time there can be no doubt that cirrhosis is not an essential feature of this disease at any of its

stages, and I have not yet seen a patient showing any suggestion of liver disorder. There is, however, a possible relationship between familial telangiectasia and neurofibromatosis, and I have seen a family suffering from the latter condition in whom there are several affected persons also suffering from unexplained epistaxis; at the same time I have not found any definite evidence of neurofibromatosis in patients suffering from telangiectasia, although I have thought that the incidence of skin tags, patches of pigmentation, and other slight abnormalities of the skin is higher than usual in these people. If there should prove to be any relationship between hepatic cirrhosis and familial telangiectasia it is important to remember that the latter disease is recognised as being one of the most regularly inherited Mendelian dominant defects in man, and in my own large series of cases, with the exception of one or two sporadic cases of doubtful significance, I have found no exception to this rule.

I have recently satisfied myself that this condition of telangiectasia is radiosensitive and that the epistaxis can probably be cured by radium. This will prove to be important, as the disease may, and frequently does, produce completely disabling anæmia which can only be relieved when the epistaxis is arrested.—I am, Sir, yours faithfully,

Leeds, Feb. 10th.

HUGH G. GARLAND.

SODIUM MANDELATE IN CHRONIC CYSTITIS

To the Editor of THE LANCET

SIR,—A personal record of the effect of various urinary antiseptics upon chronic cystitis may be of interest to some of your readers. My catheter life began in 1932, at the age of 72, after an attack of acute retention. In spite of the most careful asepsis, the urine became infected with *B. coli* and, on the advice of a urologist, I dispensed with the use of the catheter. It was at this time that I started my experience of various urinary antiseptics, samples of urine being sent regularly for bacteriological examination to Mr. A. E. Parkes, F.I.C., public analyst for Poplar, West Ham, and Bethnal Green. I found that hexamine, citrates, bicarbonates, and sodium acetate, benzoate, and salicylate were not readily tolerated, but hexyl resorcinol and Pyridium both proved of value, the latter being very soothing to an irritable bladder. Organisms, however, were constantly present though with pyridium there were occasionally as few as 10 bacilli present per c.cm.

In November, 1935, I began a course of sodium mandelate (3.5 g.) and ammonium chloride (1 g. cachet) four times a day, restricting my fluid intake to two pints. The immediate effect of this remedy was to produce a nocturnal diuresis. Despite some thirst, anorexia, and nausea, I persisted with the treatment for 13 days, and the complete disappearance of bacteria from the urine made the discomfort worth while. Five weeks later, following exposure to cold—I went to vote—I had another attack of cystitis and of acute retention necessitating catheterisation and the infection probably recurred. Sodium mandelate was again taken on Nov. 22nd and 23rd, but this time I decided to reduce the dose of ammonium chloride to 1 × 1 g. cachet daily, and this proved sufficient to make the urine acid to methyl-red. Nevertheless, the treatment caused some strangury and after two days it was stopped. Once more, however, it must have proved capable of destroying the organisms, for a sample of urine was taken next day (Nov. 24th) and no *B. coli* could be grown from 1 c.cm. Now, 13 weeks later, though there is still two ounces of residual urine and some-

times more, necessitating catheterisation night and morning, the urine is quite clear and bright and I am comfortable and practically symptom-free. (I started catheterisation again on Nov. 17th after 15 months without passing a catheter at all.)

Mr. Parkes carried out some experiments on the mandelic acid content of the urine. From one specimen of 10 c.cm. he extracted 20 mg. of mandelic acid, which indicates a concentration of 0.2 per cent., and he was able to show that at 37° C. a 0.1 per cent. solution of pH 4 of the acid in urine was fatal to *B. coli* in one hour, though a 0.007 per cent. solution had no effect in two hours.

The chief lessons I have learnt are that 1 g. only of ammonium chloride per day is sufficient to acidify my urine, and that sodium mandelate taken for 2-3 days whenever the urine becomes cloudy clears up the infection. The comfort of having got rid of the urinary infection cannot be expressed. After I had spent a small fortune trying other remedies, sodium mandelate finally did the trick and, up to the present, has given me a new lease of life.

I am, Sir, yours faithfully,

Teddington, Feb. 9th.

F. W. ALEXANDER.

CARD PARTY FOR MEDICAL CHARITY

To the Editor of THE LANCET

SIR,—In your issue of Feb. 8th I note you have a record on p. 329 of the case *Williams v. Trevor*, but this account does not include the final statement of counsel or the remarks of the judge. Will you please insert in your next issue that statement, which was as follows:—

Sir William Jowitt said he desired to apologise for a mistake he made in opening the case. In all newspapers he was reported as having said that the card party was "for the benefit of the Ivory Cross National Dental Aid Fund of the Royal Northern Hospital." The Dental Aid Fund was quite distinct from the Royal Northern Hospital and nobody connected with the hospital figured on the invitation card.

Mr. Justice Finlay said: "There can be no doubt that the president and officers of the eminent charity concerned knew nothing about it."

I am, Sir, yours faithfully,

GILBERT G. PANTER,

Secretary, Royal Northern Hospital.

Holloway, N.7, Feb. 11th.

ACETYLCHOLINE FOR PAROXYSMAL TACHYCARDIA

To the Editor of THE LANCET

SIR,—In an article in your issue of Dec. 7th, 1935 (p. 1291), I quoted Dr. Isaac Starr Jr., of the University of Pennsylvania, Philadelphia, as having used acetylcholine in a series of cases of paroxysmal tachycardia. I have since received an interesting letter from Dr. Starr, in which he says, amongst other things:—

"I write to try to clear up a point which I am afraid may cause serious difficulty if it is not appreciated. You speak of me as having described the termination of paroxysmal tachycardia after subcutaneous injections of acetylcholine. This is not correct. I used acetyl- β -methylcholine, trade name, Mecholyl, made by E. Merck (Darmstadt). Given subcutaneously this is somewhere between ten and twenty times as powerful as acetylcholine. Like yourself, I have never seen any unpleasant sequelæ after injecting acetylcholine in the dosage you gave. Indeed doses of this size are seldom followed by demonstrable drug effect. On the other hand an injection of 75 mg. of acetyl- β -methylcholine to a boy of 14 would probably have produced enough vagus effect to stop the heart altogether and I would make no guarantee that it

would resume. I hope you will do what you can to get the different pharmacological effects of the many active choline derivatives straightened out in the minds of the physicians. I am very fearful that someone may use acetyl- β -methylcholine in the dosage proper for acetylcholine subcutaneously. If so, I hope they have atropine ready at hand."

I hope the publication of this letter will be an appropriate warning; and I should like to take this opportunity of apologising to Dr. Starr for having misquoted his work.—I am, Sir, yours faithfully,

A. B. STENHOUSE.

Radcliffe Infirmary, Oxford, Feb. 10th.

CHILD BORN WITH A FOREIGN BODY IN THE HEART

To the Editor of THE LANCET

SIR,—We are fully aware of the incredible nature of this case, but feel impelled to place on record what we believe to be an occurrence unique in the annals of pathology.

A female child was born at term to a primipara who had an uneventful gestation and a normal labour. The baby also appeared normal in every way, but died suddenly some hours after birth, and for no apparent reason. A post-mortem was ordered, and this was carried out with meticulous care by one of us (T. T. W. E.) in the presence of the other (W. M. C.), who was assisting and observing closely, as the case was his, there being no professional connexion between us. The mortuary attendant was also a witness.

Nothing of importance was observed until the heart was removed, laid beside the body on the post-mortem slab, and dissected with a scalpel and a pair of surgical scissors, which were unplated. On opening the right ventricle, a small, bright object was seen lying free within the cavity, and was extracted under three pairs of curious eyes. It was a small piece of metal resembling brass or gilded tin, appearing to be a circlet of sorts, folded upon itself, with regular serrations along its edge, and measuring roughly 3 by 2 mm. It looked something like the claw setting of a toy jewel ring such as is found in Christmas crackers.

We emphasise that there was no possibility of its having been dropped by one of us as we bent over the heart; of its having been shed by one of the instruments used; or of its having been picked up from the post-mortem table. We very naturally examined these possibilities critically before ruling them out. The explanation of its presence, forced upon us by exclusion, seems as fantastic as the discovery itself; but we would welcome alternative suggestions. It is, that the foreign body was lying within the mother's uterus at the time of conception and that the growing ovum enfolded it, so that it finally came to lie where it was found. When the placental circulation ceased and the child's heart "took over," it caused some momentary effect which produced syncope.—We are, Sir, yours faithfully,

T. T. W. EATON,

W. MULHALL CORBET.

Canvey Island, Feb. 8th.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Rear-Admiral John S. Dudding, C.B., O.B.E., K.H.P., has been placed on the Retd. List at his own request on relinquishing charge of the R.N. Hospital, Plymouth, where he has served for three years. Surg. Rear-Admiral Francis J. Gowans, who in 1933-35 was in medical charge of the hospital ship *Maine* has succeeded him.

Surg. Comdr. W. G. C. Fitzpatrick to *Vernon*.
Surg. Lt.-Comdr. V. G. Horan, M.B., to *Pembroke* for R.N. Hospital, Chatham.
Surg. Lt.-Comdr. (D.) S. Mawer to *Drake* for R.N.B.
Surg. Lt. (D.) W. J. Wolton to *Hood*.
Surg. Lt. E. J. Littledale to *St. Vincent*.

ROYAL NAVAL VOLUNTEER RESERVE

Proby. Surg. Sub-Lts. to be Surg. Sub-Lts.: R. T. May, P. de B. Turtle, R. F. B. Bennett, C. P. Nicholas, and L. S. Anderson.

ARMY MEDICAL SERVICES

Lt.-Col. S. W. Kyle, from R.A.M.C., to be temp. Col. while employed as A.D.M.S., 5th Div.
Lt.-Col. R. M. King, from A.D. Corps, to be Col.

ROYAL ARMY MEDICAL CORPS

Capt. G. Anderton, R. J. G. Hyde, and R. V. Franklin to be Maj.

Capt. N. H. Lindsay, h.p. list, is restd. to the estab. The results are announced of the examination (in written subjects) of officers with a view to promotion in the Regular Army, Indian Army, and Dominion Forces, which was held at stations abroad (excluding India) last October. Among the successful candidates were Capt. T. F. M. Woods and M. R. Burke, R.A.M.C., and Maj. J. E. A. Tessier, Royal Canadian Army Medical Corps.

ARMY DENTAL CORPS.

Maj. J. S. Smith to be Lt.-Col.

TERRITORIAL ARMY

Col. P. H. Mitchiner, T.D., K.H.S., from A.D.M.S., 47th (2nd Lond.) Div., is attd. to the 1st Anti-Aircraft Div. for duty as A.D.M.S.

Lt.-Col. W. A. Robertson, M.C., from R.A.M.C., to be Col. and is apptd. A.D.M.S., 51st (Highland) Div.

Lt.-Col. and Bt.-Col. W. A. Robertson, M.C., from T. A. Res. of Off., to be Lt.-Col. and relinquishes the Brevet rank of Col.

Lts. H. C. Stewart and P. Brookes to be Capt.
Col. R. E. Bickerton, D.S.O., T.D., from 56th (1st Lond.) Div., to be Hon. Col., R.A.M.C. Units, The Lond. Div.
The surname of Lt. J. L. Cowan, M.D., M.R.C.P. Edin., is as now described and not as notified in the *Gazette* of Jan. 24th, 1936.

J. R. Dawson to be Lt.

ROYAL AIR FORCE

Wing-Comdr. J. Kyle to Medical Training Depôt, Halton, for duty as Commanding Officer, vice Group Capt. E. W. Craig, M.C.

Flight Lts. J. Hutchieson and C. A. Lewis to R.A.F. General Hospital, Hinaidi, Iraq.

Flight Lt. J. Hill is promoted to the rank of Squadron Leader.

Flying Offrs. H. L. Willcox, R. A. Cumming, and L. E. A. Dearberg to R.A.F. General Hospital, Hinaidi, Iraq; S. R. C. Nelson to Central Medical Establishment, London.

Flying Offr. W. G. S. Roberts is promoted to the rank of Flight Lt.

DEATHS IN THE SERVICES

The death occurred in London on Feb. 4th of Major ARTHUR EDWARD MILNER, R.A.M.C. Born in 1867 he was educated at Bristol and Guy's Hospital, where he was Clark scholar in surgery and Saunders scholar in medicine. After taking the conjoint qualification in 1892 he won the Montefiore prize in military surgery at Netley, and entered the Army as a surgeon lieutenant. He became captain in 1897, major in 1906, seeing service on the N.W. frontier of India and with the Tirah Expeditionary Force, when he was awarded a medal with 2 clasps. In the South African War he took part in operations in Natal and at the defence of Ladysmith, gaining the Queen's medal with 3 clasps. He was placed on retired pay in July, 1914, but a month later was recalled to the active list.

PUBLIC HEALTH

MENINGEAL TUBERCULOSIS

EPIDEMIOLOGY AND TYPE OF TUBERCLE BACILLI

By W. T. MUNRO, M.D. St. And., F.R.C.P. Edin.

MEDICAL SUPERINTENDENT, GLENLOMOND SANATORIUM,
KINROSS; AND

HAROLD SCOTT, M.B. St. And.

ASSISTANT MEDICAL OFFICER AT THE SANATORIUM

In 1932 Dr. Stanley Griffith¹ reviewed the relative incidence of human and bovine tubercle bacilli in meningeal tuberculosis in England. Most of these viruses were obtained from Leeds and the surprising feature was that 10 out of 30 specimens of cerebro-spinal fluid yielded bovine type bacilli. In a later communication² he dealt with 214 English and 37 Scottish cases. The former yielded 52 (24·3 per cent.) bovine types, while the latter yielded 15 (40·5 per cent.). The English cases were from widely different localities. From Leeds one noted 10 bovine infections among 49 city cases (20 per cent.) and 8 bovine infections among 17 rural cases (47 per cent.). Throughout this report there was a higher incidence of bovine types in rural areas.

The Scottish cases reported by Dr. Griffith in this review included 18 of the present series with 33 per cent. bovine types; 15 from Aberdeen with 47 per cent. bovine types; and 4 from Ayr with 50 per cent. bovine types.

Dr. Agnes Macgregor has since reported³ that 14 out of 50 cases of meningeal tuberculosis in Edinburgh (28 per cent.) could be ascribed to bovine bacilli; only 8 of these 50 lived in rural areas and 3 of these were infected with the bovine type. Dr. Blacklock⁴ states that 12 out of 60 cases in Glasgow (20 per cent.) yielded bovine bacilli, and notes that the bovine percentage was higher in country (27) than in city (18) children.

The series here described comprises cases of meningeal tuberculosis from Glenlomonid Sanatorium admitted from year 1924 to date, and specimens of cerebro-spinal fluid sent us between 1932 and 1935 from the wards of the Royal Infirmary, Dundee, by Prof. A. Patrick, Dr. James Thomson, and Dr. Gordon Clark, to whom we are much indebted for information. Specimens of cerebro-spinal fluid from 59 cases have been examined. Meningeal tuberculosis is not an uncommon mode of death in cases of chronic pulmonary tuberculosis and 9 of the specimens examined were from such patients. These were all adults whose sputa yielded us eugonic growths of typical human types and similar types were also grown from the cerebro-spinal fluids. These 9 cases are not included so that we limit our review to cerebro-spinal fluids from 50 patients who came under observation on account of symptoms suggesting meningeal involvement.

In our earlier cases no attempt was made to obtain growths direct from the cerebro-spinal fluid and the fluid was injected into a guinea-pig. In later years, as we became more certain of growth, direct inoculation of suitable media became the rule and was carried out as well as inoculation of a guinea-pig. In all, 27 were obtained by direct inoculation, while the others were obtained solely by inoculation of a guinea-pig.

DISTRIBUTION OF CASES

Of the 50 cases 14 were from Glenlomonid and 36 from the Royal Infirmary, Dundee. Of the

Glenlomonid cases 7 and of the Dundee cases 11 proved bovine in type. Glenlomonid Sanatorium receives its patients from the counties of Fife and Kinross, but exclusive of the large burghs of Kirkcaldy and Dunfermline; so that apart from some smaller burghs the patients are drawn from purely rural areas.

Of the Dundee patients 4 (in each of whom the virus was found to be bovine) came from rural areas—viz., 3 from rural Perthshire and 1 from a rural district of the county of Angus. No human type Dundee case came from a rural area, so that, all told, 18 cases came from rural areas and yielded 11 bovine types, while 32 cases were urban and yielded 7 bovine types.

Tuberculosis in the human subject due to bovine bacilli is much more a rural than an urban problem and this aspect will be more in evidence as facts are elicited in this paper.

CULTURAL CHARACTERISTICS AND PATHOGENICITY

Of 50 strains, 18 (36 per cent.) exhibited the cultural characteristics of the bovine type bacillus while 32 were identical with the eugonic human type bacillus.

Before acceptance of a dysgonic moist-looking growth as being a bovine type a pathogenicity test has always been carried out, and the test used by us is the intravenous inoculation of a rabbit of about 1500 g. weight with 0·01 mg. of the wet virus. A bovine strain will kill the rabbit in approximately thirty days, the lesions being those of progressive generalised tuberculosis, while the human strain in the same dose will scarcely ever kill the rabbit and certainly not in less than 90 days, and as a rule produces only minimal non-progressive lesions. All the dysgonic types proved fully virulent to the rabbit and were true bovine types. Moreover, all these viruses were examined at Cambridge by Dr. A. Stanley Griffith and accepted as bovine types.

Table I. shows the age-distribution according to type.

TABLE I

—	Total.	Human.	Bovine and per cent.
0-5 years	20	9	11 (55)
5-15 „	18	14	4 (22·2)
Over 15 „	12	9	3 (25)
—	50	32	18 (36)

These figures do not surprise us in any way. We were quite prepared for a high percentage of bovine types in the age-group 0-5 years. All the children under two years of age who showed disease due to the bovine type bacillus had been fed on cow's milk unboiled.

Noteworthy too is the number of bovine types found in persons over 15 years. The oldest in the series was the case of a ploughman of 30 years of age.

RURAL AND URBAN DISTRIBUTION

When we come to separate our cases by a rural and urban distribution, we meet with some very significant facts as shown in Table II.

It will be seen that there is a big difference in the percentage of bovine infections in rural and urban areas. This is to be expected, for there is no pasteurisation of milk in rural areas and no dilution of infection by bulking. In Dundee about 60-70 per cent. of the city's supply may be considered safe,

whereas it is doubtful if any rural supply can be considered safe apart from milk from a tubercle-free herd. The significant fact is that the incidence of

TABLE II

	Urban.		Rural.	
	Human.	Bovine.	Human.	Bovine.
0-5 years	9	5	—	6
5-15 „	11	2	3	2
Over 15 „	5	—	4	3
Total	25	7	7	11
Percentage bovine ..	—	21·9	—	60·1

bovine types is three times greater in the rural areas than in the city. The only protection in rural areas is to boil the milk.

EPIDEMIOLOGY

The Tables show that the rural population supplies us with far the greater proportion of our cases due to the bovine bacillus. Even in the later age-periods we find cases of meningeal tuberculosis due to the bovine type from rural areas. Dr. Griffith reports the case of a man of 32 years of age from Lincolnshire whose cerebro-spinal fluid yielded a bovine virus and the oldest case in our series is that of a ploughman, 30 years of age, from Perthshire; while we can also show the cases of a youth of 19 from Fifeshire and a girl of 17 from Perthshire, from each of whom bovine types were obtained. Ploughmen in Scotland usually receive milk from the farm as part payment, and the question of compensation might reasonably arise if disease due to the bovine bacillus was found to be the cause of death. The difficulty would be to fix the actual source of the infection. Ploughmen do not remain long in one service.

In the prevention of tuberculosis, one of us has previously stressed the fact that after notification of a case of meningeal tuberculosis the family must be carefully reviewed, especially to ascertain if there is a case of pulmonary tuberculosis or other visceral tuberculosis in the household. If no other case of tuberculous disease is found, full inquiry as to the source of the milk-supply must be made.

With regard to the cases from Fife county, it was easy for us to get all the facts. In every instance where a human type virus was found in the cerebro-spinal fluid there was, or had been, a known case of pulmonary tuberculosis in the home. With regard to the bovine types from Fife county, the discovery of so many cases of pulmonary tuberculosis due to the bovine type virus makes us keep in mind that we must be careful to review the whole family even if we do know the virus from the cerebro-spinal fluid is bovine in type. In no case due to the bovine type from Fife, however, did we find anyone with visceral tuberculosis in the home, and so in these cases we were forced to regard the milk-supply as the likely source of infection.

In recent years it has been our practice to notify Dr. G. Pratt Yule, medical officer of health of Fife, at once whenever we have found bovine type in a cerebro-spinal fluid. From the cases notified, Dr. Yule has been able to find an offending cow in two instances. We were much disappointed to be unable to find the source in the case of an eight months' old child whose virus was bovine in type. Careful examination of the herd by the county veterinary officer failed to reveal disease in any cow and a biological test of the milk proved negative.

Urban cases.—When we come to consider the epidemiology of the cases from Dundee, we confine our inquiries to those cases in which a bovine virus was obtained. We are indebted to Dr. John Hunter, tuberculosis officer, Dundee, for his help in obtaining full information about these cases.

In Dundee there are two large companies which pasteurise milk and over 50 per cent. of the city's supply is pasteurised, while 10 per cent. will be from tubercle-free herds; so that probably between 60 and 70 per cent. of the supply will be safe. There are many deliveries from the churn by cart and there are a few dairies in the city where cows are bought in and milked till dry and then sold. These cows never go out from the byre.

In 11 instances the bovine type virus was found. The family history in one case revealed that the father suffered from pulmonary tuberculosis and tubercle bacilli of human type were obtained from his sputum; he had also had extensive tuberculosis of the cervical lymph nodes ten years previously. This finding is in keeping with those cases described by Walker⁵ when he reviewed the lack of evidence of human-to-human infection by the bovine type. In this case there was opportunity of infection by milk as the supply was not from a safe source.

In one other case there was a history that the father had had a hæmoptysis, but no sputum ever was obtained.

In every case the milk-supply was from a doubtful source and there was a common dairy in three instances. This information has been passed to the medical officer of health and we learn that this dairy buys in milk for sale. It will be most difficult to overtake a complete examination of the cows in such a circumstance.

IS THE PRESENT LEGISLATION SUFFICIENT FOR THE EXAMINATION OF COWS?

The 1914 Milk and Dairies Act is the Order under which a local authority can act. This is supplemented by the Tuberculosis Order, 1925. These appear to us to be utterly insufficient and the faults lie in two places.

Firstly, the definition of a dairy is too restricted. The term includes any creamery, farm, &c., from which milk is sold or supplied for sale, but excludes premises where cows are kept solely for the use of the farmer and his servants, or where milk is sold to a very limited number of neighbours. Therefore such premises need not be registered and there is no inspection.

With the knowledge that deaths have occurred among farm servants, and that cervical lymph-node tuberculosis is not uncommon among farm servants' families, being often due to the bovine type bacillus, it is obvious that all places where milk is obtained should be inspected. This is not meant to imply that the farmer is careless as to milk-supply to his staff. For example:—

A farmer residing a few miles from Glenlomon Sanatorium purchased a cow as sound, the milk to go to his staff. The farm grieve and his wife did the milking and noted at once a slight induration in one quarter. The cow was again examined and passed as sound, but the grieve brought the strippings of the indurated quarter here for examination and numerous tubercle bacilli were found. On report of this the farmer had the animal destroyed at once and examination revealed extensive tuberculous disease.

The farmer who merely keeps cows to supply milk to his staff would, we feel sure, not knowingly retain an unsound cow, but there ought to be inspection.

The second serious defect in the Order lies in the qualification of disease in the cow. The cow-keeper must report to the local authority if a cow (1) has a chronic cough, (2) is emaciated, or (3) has disease or induration in an udder. But these, surely, are terminal features? A cow in any such state, if tuberculosis is the cause, will have done all the damage she can do, and we can hardly think that the dairy farmer only suspects when any of the above-mentioned states is present. And the amazing feature in the Order follows. If the dairy farmer reports such an animal to the local authority and on inspection tuberculosis is found he is compensated. It is very different with other tradesmen. A sale of adulterated foodstuffs is punishable but the farmer is compensated if he notifies an unsound beast.

These Orders do not deal with the problem at all, but leave it possible to profit by the sale of unsound milk and subsequently by notification of the unsound cow.

CONCLUSIONS

Of 50 cases of meningeal tuberculosis 18 (36 per cent.) were attributable to bacilli of bovine type. Rural cases give 60 per cent. of bovine types while urban cases yield 22 per cent. Taking the figures for Fife alone, we find that 7 out of 14 (50 per cent.) are of bovine type—a figure which probably gives a better idea of the actual position. Tuberculosis due to the bovine type is an urgent rural problem, and the present legislation is inadequate.

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3. Macgregor, A. : *Trans. Tuberc. Soc. Scotland*, 1933-34, p. 38 ; or *Edin. Med. Jour.*, March, 1935.
4. Blacklock, J. W. S. : *Ibid.*
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Medical Inspection in American Schools

It is a common experience to meet a friend just returned from a foreign country full of enthusiasm for its wonderful organisation, and soon after another who has nothing to tell but of its backwardness and deplorable conditions. Strangely contradictory accounts have been given of the state of school medical work in America and the discrepancies may be resolved by study of a searching review by Dr. J. F. Rogers, of Washington, in the *Quarterly Bulletin* of the League of Nations Health Organisation. The degree of efficiency ranges from organisation such as that in New York State to that in Illinois. In New York State there is a director with a central staff of eight : (1) a general supervisor of medical inspection ; a supervisor of (2) sight and hearing ; (3) oral hygiene ; (4) heart and lungs ; (5) psychiatry ; (6), (7) two supervisors of school nursing ; and (8) a supervisor of health for teacher-education institutions. The outside staff consists of 1300 school medical inspectors and 600 nurses. The inspectors have had special post-graduate training in the principles of health education and in its organisation in public schools. The nurses, after full training, have all taken an approved course in health education. There are besides many trained dental hygienists working under the dentists. In Illinois there is no legislation on the subject at all, and this is the case in 5 other States ; although in some of these there may be good systems of examination in certain schools. In 27 the law is mandatory, in 13 it is merely permissive. The inspections are carried out in 3 States by the county health officer, in 5 by a physician, in 9 by a physician or a nurse, in 6 by a physician or a teacher, in 5 by a physician, teacher, or nurse, in 3 by a nurse, in

7 by a teacher, and in 2 by a dentist only. Obviously a teacher cannot make a full medical examination but he may recognise defects such as those of sight and hearing, and in some places teachers are given specific instruction in the detection of gross defects.

On the credit side of the account must be put the fact that in 20 States the examinations are annual—a frequency which is being advocated by some reformers in this country. Against this must be set the fact that in only 14 States is there a full general medical examination. In general the object of the inspection is to remove obstacles to education rather than to promote better health and physique. The school medical officer who has graduated in public health is nearly non-existent. The administration is more often conducted by the education department than by the health authority, and this bias is increasing ; there is something to be said for it if it is true that there is less of politics in the work of education than of public health and hence a more secure tenure of office and personnel. The examinations are looked upon as educational in another sense ; they teach the children, and perhaps their parents, the value of periodic medical supervision and may lead to the habit of seeking it in later life. Instruction in hygiene does not appear to be widely organised.

Special schools for the blind and partially blind, for the deaf and hard of hearing, for the crippled and the delicate, are highly developed in some States and non-existent in others. Some types of special schools—e.g., those for the partially deaf—can, we believe, be definitely traced to the example of our own country. Treatment facilities vary greatly. A common practice is just to inform a parent that the child "seems to be suffering" from some abnormal condition. Apart from dental clinics there are few treatment centres, and even within the boundaries of New York State the proportion of defects treated varies from 15 to 95 per cent.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED FEB. 1ST, 1936

Notifications.—The following cases of infectious disease were notified during the week : Small-pox, 0 ; scarlet fever, 2509 ; diphtheria, 1304 ; enteric fever, 27 ; acute pneumonia (primary or influenzal), 1605 ; puerperal fever, 52 ; puerperal pyrexia, 101 ; cerebro-spinal fever, 27 ; acute poliomyelitis, 6 ; encephalitis lethargica, 3 ; dysentery, 52 ; ophthalmia neonatorum, 65. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Feb. 7th was 4233, which included : Scarlet fever, 1089 ; diphtheria, 1096 ; measles, 693 ; whooping-cough, 681 ; puerperal fever, 17 mothers (plus 13 babies) ; encephalitis lethargica, 281 ; poliomyelitis, 4. At St. Margaret's Hospital there were 24 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox, 2 (1) from enteric fever, 41 (5) from measles, 4 (0) from scarlet fever, 25 (2) from whooping-cough, 46 (8) from diphtheria, 58 (21) from diarrhoea and enteritis under two years, and 98 (19) from influenza. The figures in parentheses are those for London itself.

The mortality from influenza is maintained, the total deaths for the last nine weeks (working backwards) being 98, 104, 89, 110, 110, 80, 67, 62, 45. The deaths this week are scattered over 46 great towns, Birmingham reporting 9, Manchester 5, Bradford 4, Leeds 3, no other great town more than 2. Liverpool had to report 11 deaths from measles, Salford 5, Sheffield and Warrington each 3. Liverpool also reported 5 deaths from whooping-cough, Birmingham 3. Deaths from diphtheria were reported from 29 great towns : 3 each from Hull, Liverpool, and Plymouth, 2 each from Bradford, Manchester, and Birmingham.

The number of stillbirths notified during the week was 251 (corresponding to a rate of 42 per 1000 total births), including 31 in London.

OBITUARY

SIR CHARLES BALLANCE

THE death occurred on Saturday last of the distinguished surgeon and neurologist, Sir Charles Ballance; he was 79 years of age and had been recently in a delicate state of health. A notice of his life will appear later. The following tribute to him as man and worker has been received from Sir Charles Sherrington: "As one who knew Sir Charles Ballance and in earlier years saw him much I gladly accept the suggestion to pay his memory, at this time of our loss, some tribute in words even if brief. Between the years 1887 and 1895 at St. Thomas's Hospital medical school, Ballance, and with him Walter Edmunds, was a colleague who, I might say literally, frequented the physiological laboratory. Among other research which the two did there were their experiments on the bursting strain of arteries. Also at the Brown Institution, which was under me in those days, they did work on the thyroid and the results of its extirpation in the monkey.

"For Ballance in those years any hour up to 10 o'clock in the evening might bring him. He used to smile and say, 'at home they have yet to understand that I like my coffee cold!' The microscope would occupy us sometimes until after midnight. He was interested in an experimental study as to the source and behaviour of the cells which repair after inflammation. He would be so keen in following the movement of the cells that he would read 'motives' into their behaviour. In Walter Edmunds he had an admirably objective collaborator. Their tracing of how the tied artery becomes structurally closed when and where ligated in continuity without rupture of its coats stands as a monument to their admirable collaboration.

"A colleague with whom in those years, and after, he did much research was Samuel Shattock. At the period I am alluding to they were engaged in a quest for possible parasitic protozoa in cancer. They conducted the search with attempts at culture as well as by microscopic examination of the cancerous tissue. I was privileged to look on at times, and the pains taken, the long patience shown, the scrupulous loyalty to results dishearteningly negative were an example to remember. Ballance had an enthusiastic admiration for Shattock's great knowledge of and experience in morbid macro- and micro-anatomy. He would compare, and prefer, him to Rudolf Virchow, and add, 'Shattock will never disappear into politics!' a remark with which it was not difficult for all who knew Shattock, and that he carried habitually with him a copy of St. Francis of Assisi, to concur.

"After removing from London I had to my regret far less opportunity of seeing Ballance. When I did he always renewed just the same frank friendship. His enthusiasm for laboratory research in surgery did not diminish. He had undertaken his experiments on nerve-suture and nerve-grafting and the repair of nerves. The experimental work by David Ferrier always remained a source of inspiration to Ballance. He appraised Ferrier's work on the removal of portions of the brain in apes as the actual pioneer-step leading to modern cerebral surgery. He followed with intense interest the recent developments by his own college, the Royal College of Surgeons of England, in providing facilities for experimental research in surgery—namely, the field laboratory at Down, in Kent, and the installation of experimental laboratories in the College itself.

"If as he grew older he seemed a little liable to 'preach' somewhat, this is explained by the fact that the theme of which he never tired was experimental research in surgery. Ballance was sincerity itself. A scrupulously conscientious man, on the invasion of Belgium by Germany in 1914 he took the German decoration, bestowed on him some years before, to the Thames Embankment and flung it into the river, an incident he would relate with a short laugh of satisfaction. In 1933 he was awarded the Lister Memorial medal and gave the Lister Memorial lecture. This latter gave him opportunity to report upon and to demonstrate some of his latest work, done with junior colleagues, on nerve-grafting. The award and the occasion were a profound satisfaction to him. Those who were present are not likely to forget the impression he conveyed to all there of what he stood for."

WILLIAM HENRY BATTLE, F.R.C.S. Eng.

CONSULTING SURGEON, ST. THOMAS'S HOSPITAL

THE death occurred early on Sunday morning, Feb. 2nd, of William Henry Battle, consulting surgeon to St. Thomas's Hospital, following an illness of several months' duration.

Born in Lincoln in 1855, the son of Mr. F. R. Battle, an alderman of that city, he was one of a family of nineteen children. He received his general education at Lincoln Grammar School and entered St. Thomas's Hospital in 1873. He was a successful student, a prizeman and Solly medallist, and obtained the diplomas of M.R.C.S. Eng. and L.S.A. Lond. in 1877. He served

a fine apprenticeship to his later position on the staff of St. Thomas's, being house physician, house surgeon, and resident accoucheur. In 1880 he took the diploma of F.R.C.S. and became surgical registrar at the hospital, proceeding to the position of resident assistant surgeon. At the same time he began a long connexion with the Royal Free Hospital by appointment to the staff as assistant surgeon

and demonstrator of practical surgery in the School of Medicine for Women. He continued his early obstetric work by acting as surgeon to the Dispensary for Women in Shadwell and was also appointed to the staff of the East London Hospital for Children.

In 1892 Battle became assistant surgeon to St. Thomas's Hospital, and in that year, in succession to Sir John Tweedy, he joined the staff of THE LANCET as general surgical adviser. Such was the arrangement of work within the office of THE LANCET in those days that this post implied the editing of a department entitled A Mirror of Hospital Practice, a section of the paper that was much developed by Tweedy. It entailed the personal visiting of the



MR. BATTLE

(Photograph by Beresford)

operating theatres in London on certain days, as well as the securing of reports from the theatres of large hospitals without the metropolis. Already when Battle succeeded to the work its design, framed in an era when operations were few and when it was possible to relegate their performance to particular hours of the week, had become ill-defined, for the task of anything like inclusive reporting could not be attempted. Thus under Battle's editorship the *Mirror of Hospital Practice* changed in character and became a method of personal approach by the paper to authors whose contributions would be obviously valuable to our readers. In this way Battle served the paper well, while it was his habit, following that of Tweedy, to precede the accounts of the operations reported with historical notes of analogous cases or of similar displays of technique, such as to-day are very usually furnished by the authors themselves in relation to their communications. The provision of these notes, which sometimes formed a ground-plan for longer articles, came the easier to Battle, in that he had been editor for two years of the surgical reports of St. Thomas's Hospital and a frequent contributor to those reports. He seldom recorded in the *Mirror of Hospital Practice* any work of his own, but he published in our columns, in the *Transactions of the Pathological Society* and in those of the *Clinical Society*, numerous articles dealing with a large range of clinical subjects.

In 1890 Battle was appointed a Hunterian professor at the College of Surgeons, and delivered a valuable series of lectures on injuries to the head. The composition of these lectures entailed upon him investigation of a large number of recorded cases, and the work, carried out with judgment and acumen, brought together in readable form a great deal of valuable information. In 1906, now full surgeon to St. Thomas's Hospital and the Royal Free as well as joint lecturer in practical surgery at the former institution, he gave a course of clinical lectures at St. Thomas's, entitled the "acute abdomen," in which he pointed out in a detailed manner the difficulties presented in diagnosis, and therefore in the first stages of treatment, presented by cases of appendicitis, intestinal obstruction, intussusception, perforations in the alimentary tract, and gynaecological inflammation. His personal knowledge ranged almost from the time when operative interference in these spheres was contemplated only as a last resource, so that he was able to tell the full story in a graphic manner.

In addition to these lectures and reports he wrote, in collaboration with Mr. E. M. Corner, a practical treatise on the appendix and its surgical complications. The work attained to a second edition and marked the great interest with which Battle had always followed the development of abdominal surgery. Its publication added to his high claims to prominence as a surgeon. "In my opinion," writes Mr. Corner, "he was unequalled for dexterity and clever manipulation in abdominal conditions. His ingenuity and boldness were justified by good results. He could on necessity be extremely quick and when the unexpected happened he was never disturbed, for his skill and experience allowed him to adapt procedure in accordance with emergencies. As a teacher he was forcible, distinct, and quiet, and the practical value of his advice was aided by care in suiting his instruction to his audiences. As a colleague I can speak of him as always reasonable, consistent, and loyal. He earned the respect of all who worked with him."

Battle at the time of his death was consulting surgeon at the Royal Free Hospital, and Mr. Willmott Evans, who for many years was his colleague at that institution, describes the many opportunities he had of seeing Battle at work. He writes as follows: "As a surgeon Battle was an expert operator, rapid where the facts showed the need for action, but in all doubtful cases very careful. He was a scrupulous diagnostician so that the information obtained at the operation usually coincided exactly with his first opinion, although he never had any hesitation in modifying his diagnosis as further information or circumstances warranted. His teaching at the medical school associated with the Royal Free Hospital was much valued, especially by the senior students who could appreciate the caution with which he balanced his data, although he showed his care in the instruction of more junior students by his readiness to clear up any point in his lectures or demonstrations which presented difficulty to them. He always took particular pains to point out to students which were the things that seemed to him of the most importance when coming to conclusions, so that he effectively made clear the basis on which his teaching was formed and the circumstances which should dictate diagnosis."

Battle's interest in the diagnosis to be made and the procedure to be followed in abdominal surgery continued through his life. As far back as 1910 he delivered the annual oration to the Medical Society of London upon intraperitoneal injuries, and in that discourse gave a lucid description of where particular attention should be paid in ascertaining the exact lesion present. And only three years ago, after considerable retirement from St. Thomas's Hospital, he wrote in these columns a valuable letter upon the occurrence of appendicitis, considering that obvious evidence existed for a thorough scrutiny into the increasing incidence of the disease.

Mr. Battle retired from the position of surgeon at St. Thomas's Hospital in 1925 with the rank of consultant, leaving behind him the reputation of a devoted hospital servant as well as a great surgeon and teacher.

Sir Cuthbert Wallace writes: "Every surgeon has attributes by which he is remembered by those that he taught. In thinking of Battle the one thing that stands out in my memory was his devotion to his duty as shown by his regularity of attendance on his hospital days. Nothing interfered with his hospital work and a student was sure to find him in his ward at the appointed time, and was equally sure of having a profitable afternoon. His teaching was simple, clear, direct, and seemed to supply just what the student wanted. This resulted in his having a large following in the wards whenever he appeared. He had a wide knowledge of the literature of his subjects and no doubt his constant writing for the journals crystallised useful data in his mind and enabled him to distinguish facts from theories, much to the advantage of those he taught. As a surgeon he may be described as sure and safe rather than brilliant, and as an operator he was neat, quiet, and without fuss. Many men still practising must have grateful thoughts for Battle."

Mr. Battle married in 1892 Anna Marguerite Vulliamy by whom he had three sons and two daughters. One son was killed in the war, and of

the survivors one is squadron-leader in the R.A.F. and the other is Mr. Richard Battle, who follows in his father's footsteps as surgical registrar at St. Thomas's Hospital.

FARQUHAR MACRAE, M.B. Glasg.

WE regret to announce the death of Mr. Farquhar Macrae which occurred on Feb. 2nd at Newmill, St. Andrews, where he had retired in 1929 after a long period of surgical practice in Glasgow and the West of Scotland.

Farquhar Macrae graduated M.B., C.M., with commendation at Glasgow University in 1895, after which he acted as house surgeon and house physician at the Glasgow Western Infirmary and Royal Hospital for Sick Children. At the termination of these appointments he studied under Prof. W. D. Halliburton at King's College, London, for some time, and thereafter became



MR. MACRAE

[Photograph by Annan

assistant to Sir Arthur Mayo Robson in Leeds. It was during this time that he gained that insight into gall-bladder surgery which stood him in great stead in later life. After a few years in Leeds, he returned to Glasgow and was appointed surgeon to the out-patient department at the Western Infirmary, where he was associated with Sir Hector Cameron and Sir Kennedy Dalziel, both in hospital and

private practice. Later he was appointed to the post of assistant surgeon to the Victoria Infirmary, surgeon to the City of Glasgow Fever Hospitals, and consultant surgeon to Ayr County Hospital. He returned to the Western Infirmary in 1922 as visiting surgeon and was appointed a lecturer in surgery to the university. On various occasions he acted as examiner in surgery both at Glasgow and Edinburgh Universities, and was a fellow of the Association of Surgeons of Great Britain and Ireland.

On his retirement in 1929 he bought a house at St. Andrews, but shortly afterwards he was invited by the General Medical Council to undertake the duties of inspector of examinations. These occupied the best part of three years, and at their termination he forwarded to the G.M.C. a report which was at once recognised as being of the greatest importance. His excellent work here led in 1933 to his being asked by the India Office to undertake the post of secretary-inspector to the newly formed Indian Medical Council and he proceeded to India, remaining there for more than a year. He found the work one of great delicacy for an official not possessing special knowledge of India and Indian educational standards, but he did valuable work in preparing the ground.

Macrae never wrote much, but he was ever a keen student of the literature of his subject and was possessed of the rare faculty of being able to sift the

grain from the chaff. Among his publications are the following: Editor, "Diseases of the Gall-bladder and Bile-ducts," second edition, 1900; joint author, Affections of the Gall-bladder and Bile-ducts, Encyc. Med.; Diagnosis of Peritonitis occurring during Enteric Fever; Cholelithiasis, Diagnosis, and Treatment, *Brit. Med. Jour.*, 1922; Diagnosis in Abdominal Diseases, Finlayson's "Manual of Clinical Medicine," 1927.

He was a man much loved by all who knew him well. With tall stature and strong countenance, he inspired great confidence in his patients and friends, while his wide experience and sound knowledge were always available to those who sought his help. As a clinician he was outstanding, so that he attracted large numbers of students to his clinics. His teaching was inspiring, based on a wide knowledge of pathology and literature in general. He was sometimes of short temper and could then employ a cutting tongue, but his actions were never petty, and he was a particularly sound judge of men, and was often consulted regarding appointments.

Farquhar Macrae built up a large surgical practice and when he retired in 1929 his loss both as surgeon and man was felt to be great. He leaves a widow to whom we extend our deepest sympathy.

A colleague of Farquhar Macrae writes: "The death of Mr. Farquhar Macrae is a great loss to the medical profession and to his many friends. His career has been outlined above and his surgical influence on the Glasgow school appreciated, but it is the influence and personality of the man which I would emphasise. Macrae had not many degrees, nor did he publish frequently. He did not seek publicity, and believed in inherent ability and honesty of purpose. Outstandingly he was a man. A tall, handsome figure, somewhat severe in expression, he inspired great confidence in all who met him; and more than confidence, for sympathy where deserved was one of his great attributes. Children loved him, and with them he was at his best. His simplicity of heart, ready understanding, and directness of purpose without excuse or explanation endeared him to them, and children are seldom wrong. The personality, the poise, the honesty of Macrae are seldom found in one human being, and with those he combined wealth of clinical acumen—that clinical sense which is of more value than much book learning; yet he had an intimate knowledge of all recent advances and a keen critical faculty as to their value.

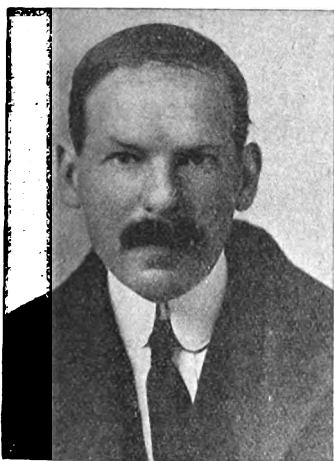
"After his retiral in 1929 he acted as inspector of examinations for the G.M.C. and for the Dental Council. His reports on these matters were so excellent that he was appointed to an extremely responsible post as secretary to the Medical Council for India. The strain and difficulties of this and the climate of India had their effect on his health and he was unable to continue and returned to St. Andrews after fourteen months' service to carry on his interest in the furtherance of medical problems and study, his work in India having laid a sound foundation for a successor. Unfortunately his illness proved more serious than was supposed and he had not many months left of active life. His funeral was attended by many friends, and his great relaxation of golf was made noticeable by the fact that a number of St. Andrews' caddies attended the graveside. They, like his medical and lay friends, appreciated the greatness of the man, great of stature, great of mind; they understood his personality, his humour,

and his loveliness. We who knew him mourn him deeply and doubt if his like will pass this way again in our time."

**ARTHUR JOHN SCOTT PINCHIN, M.D.,
F.R.C.P. Lond.**

Dr. A. J. Scott Pinchin died at his home in Gledhow-gardens on Feb. 7th. He was in his sixtieth year and had been ill with pneumonia for only three days. Born at Sutton, Surrey, in 1877, the son of Alfred James Pinchin, oil broker, he was educated at Dulwich College and St. Thomas's Hospital from which he graduated in 1906, taking the gold medal in medicine at the London M.D. examination three years later. After holding house appointments at St. Thomas's, first as house physician to T. D. Acland, then as resident anaesthetist and casualty officer, Dr. Pinchin settled for a year or

two in general practice at Egham, Surrey, becoming an active member of the Windsor Medical Society and assistant school medical officer to the L.C.C. But he soon decided to devote himself to consulting work in diseases of the chest, and to this end he secured positions on the honorary staff of the Hampstead General Hospital, the West London Hospital, and the Victoria Park Chest Hospital, to



DR. SCOTT PINCHIN

two of which at the time of his death he was senior physician. He also took charge of the tuberculosis dispensary at Hampstead and was consulted by the New End Poor-law Hospital at Hampstead and the Maidenhead Hospital.

All this work, combined with a considerable private practice, kept him more than fully occupied for 25 years, only broken by a period during the war when he had charge of the officers' hospital at Imtarfa, Malta. Dr. Pinchin was an exceptionally good diagnostician and a sound practical physician, skilful in the use of instruments and quick to see their possibilities in modern medicine. He took charge of the electrocardiograph department when it was started at Victoria Park; after the war he was early in the field with the use of the thoracoscope, and with his junior colleague, Dr. H. V. Morlock, founded the bronchoscopic clinic at the same hospital. Despite indifferent health he was an indefatigable worker, devoted to the hospital side of his work, and popular with his house staff to whose assistance he was always ready to come in trouble. Almost his last act before he was taken ill was to attend a former resident in a rapidly fatal attack of pneumonia.

"Scott Pinchin," a colleague writes, "was a very lovable person and I doubt if he had an enemy in the world. He was a man of deep religious convictions, quiet and self-effacing. A shy and rather nervous manner made him avoid formal lecturing and public speaking as far as possible. He will be

remembered by his colleagues for sterling worth and a gift of friendship."

He wrote a good deal at various times, mostly in medical journals, covering at first a wide range of intrathoracic subjects but later concentrating chiefly on chronic pulmonary suppuration. His last contribution to our columns in June, 1935, concluded a series of papers, written over many years with Dr. Morlock, dealing with abscesses of the lung. "From small collections of clinical impressions such as these," he quoted modestly, "it may become possible in time to obtain an individual experience which will bring to bear at the right moment all the weapons available for use in this distressing condition." But he was writing from an experience of 2000 bronchoscopies over a period of four years, which has added substantially to our knowledge and for which clinical medicine is in debt to his memory.

Dr. Scott Pinchin married Miss Margaret Johnson, daughter of David Johnson, a well-known inventor, who survives him. There were no children of the marriage.

JOHN HENRY WILLIAMS, L.S.A., M.P.

THE death is announced as occurring on Feb. 7th of Dr. John Henry Williams, Member of Parliament for the Llanelly division of Carmarthen. Dr. Williams, by birth a Liverpool man, received his medical education at the Cardiff Medical School and the London Hospital and was for a time medical officer in the Booth Line. When he eventually settled in Wales at Burry Port he became a prominent practitioner and energetic in public causes. He was chairman first of the Burry Port district council and later of the Carmarthenshire county council and took a leading part in the promotion of the general health of the county and also in child welfare work. A Socialist in politics he had represented Llanelly in the House of Commons for more than 12 years, a proof of considerable determination on his side, for he was not successful until his fourth attempt in 1922; but having obtained admission to the House he stood the brunt of future contests and at the general election of November last was returned unopposed. From this short record it will be clear that in Dr. Williams his community has lost a valuable servant.



DR. WILLIAMS

**WILLIAM HENRY RUSSELL FORSBROOK,
M.D. Lond.**

THE death was announced in our columns last week of Dr. William Forsbrook, a well-known practitioner in the Eaton-square district. A prominent student at the Westminster Medical School where he was Chadwick prizeman and Bird medallist, he took the diplomas of L.S.A. and M.R.C.S. Eng. and graduated with honours as M.B. Lond. in 1878, later proceeding to the M.D. degree. Before going into

private practice he held the resident posts at the Westminster Hospital and was also surgical registrar. He was a frequent adviser to medical men proposing to practise in South Africa. He died on Feb. 3rd aged 85.

THE LATE SIR JOHN MARNOCH

Emeritus Professor J. A. MACWILLIAM, F.R.S., sends the following personal appreciation of Sir John Marnoch of whom an obituary notice appeared last week :—

"Far and wide the news of Sir John Marnoch's death will reach, and everywhere touch responsive chords of deep sympathy and awaken many memories. My own mind goes back to the time, more than forty years ago, when I was so fortunate as to have his able assistance in the work of the physiology department at Aberdeen after his brilliant student career. It is grievous to think now that his fine record has come to the end. Until he was suddenly stricken by illness some three years ago he looked very young for his age; whether seen at his work or in his ideally happy hospitable home, his slender alert figure and his keen vitality and notable zest in life gave every promise of many active years still to come. The

decline of his physical strength in recent time he accepted in the fine impersonal spirit characteristic of the man. Superb operator as he was, quiet, quick, and infinitely dexterous, what was still rarer was a supreme gift of wise and balanced judgment in dealing in comprehensive and far-sighted fashion with the various considerations of complex and difficult problems. His clarity of thought was remarkable. When an involved subject had been dealt with by Marnoch it came out shorn of all non-essentials, reduced to its simplest terms and expressed in a minimum of precise and lucid sentences.

"Marnoch was a gifted musician, his strikingly beautiful hands equally at home on the violin and with the scalpel. As a golfer and a salmon fisher on the reaches of his beloved Spey he was keen and skilful—an artist in all that he touched, whether work or recreation. His great success never changed John Marnoch in the least; his simplicity, absolute sincerity, and innate modesty were conspicuous in him while life lasted. Endlessly willing and most generously helpful, with a gift of leal-hearted friendship, his memory will ever be cherished by all who knew him and had to do with him as colleagues, students, patients, or friends."

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Advertisement of Medicines and Surgical Appliances

IN the ballot of private Members of the House of Commons for the right to present Bills which will come up for second reading on Fridays between now and Easter which took place on Feb. 6th Mr. G. A. V. DUCKWORTH (Shrewsbury, Unionist) was one of the first eight names in the ballot. The Bill which he proposes to bring forward is entitled the Medicines and Surgical Appliances (Advertisement) Bill. The measure is the outcome of the work of a committee representative of the various interests connected with the trade in proprietary medicines, and aims at the removal of some of the worst abuses in the advertising of those articles. Among the deputation which presented the Bill to the Minister of Health were representatives of local authorities, the British Medical Association, the Society of Medical Officers of Health, the Parliamentary Medical Committee, the Parliamentary Committee on Food and Health, newspaper and advertising associations, the Pharmaceutical Society of Great Britain, and bodies representing the drug trade, manufacturers of surgical instruments, and the Proprietary Association of Great Britain. The prohibitions in the Bill extend only to certain types of advertising. No one is prohibited by the Bill from treating any ailment or from supplying any medicine or appliance. Certain ailments and conditions are specified, and restrictions are imposed upon certain methods of "holding out" medicines, appliances, or treatment as beneficial to those suffering from them. The Minister of Health may remove any of the specified ailments or conditions from the operation of the Act, but he may not add new ones.

THE OFFENCE OF "HOLDING OUT"

According to an explanatory memorandum drawn up by the promoters of the Bill it is proposed to make it illegal in connexion with the supply or offer of a medicine or appliance or treatment to hold it out as effective for the cure or for the prevention or for exercising any salutary influence on any of the following ailments :—

(a) Bright's disease, cancer, consumption, diabetes, epilepsy, fits, locomotor ataxy, lupus, or paralysis.

It would also be illegal in connexion with the supply or offer of a medicine or appliance or treatment to hold it out as effective for any of the following purposes :—

(b) The cure of amenorrhœa, hernia, blindness, any structural or organic ailment of the auditory system, habits associated with sexual excess or indulgence, and any ailment associated with those habits; (c) procuring miscarriage of women; (d) the promotion of sexual virility in men or of sexual desire in women.

It would be illegal for the proprietor or distributor of a medicine or appliance and for a person administering treatment to publish a document which to his knowledge contains an intimation that any person is prepared to treat by correspondence any of the ailments or conditions mentioned under (a), (b), (c), and (d). The ailments referred to are those for which the Select Committee on Patent Medicines in 1914 recommended that advertisements for cure should be prohibited. In the Bill, the prohibition is extended to advertisements claiming effectiveness for prevention and for exercising a salutary influence on the course of those mentioned under (a).

EXCEPTIONS TO THIS OFFENCE

A "holding out" which would otherwise be illegal would be permitted in the following circumstances :—

(a) By a duly qualified medical practitioner or a registered dentist in the exercise of his profession; (b) if it is directed to doctors, dentists, nurses, pharmacists, hospitals, and persons carrying on a business including the practice of medicine or dentistry, or the supply of medicines or appliances; (c) in technical publications; (d) in connexion with patent applications; (e) to a patient for whom the medicine, appliance, or treatment has been prescribed by a doctor or dentist.

Certain advertisements for articles of diet which would otherwise be illegal are proposed to be permitted. But the claim made must be no more than that, as an article of diet and not otherwise, the article is effective for the preventing or exercising a salutary influence on (but not curing) any of the ailments mentioned under (a).

A person who publishes or delivers any document which the Act makes illegal commits an offence unless he can show that he delivered it in a package containing a medicine or appliance in the form in which it was supplied to him.

DIAGNOSIS OR TREATMENT BY CORRESPONDENCE

Invitations to correspond with a view to diagnosis or treatment may not be issued by the proprietor or distributor of a medicine or appliance or a person who administers treatment. It is illegal for such a person to publish any document which to his knowledge intimates that any person is prepared to diagnose by correspondence or to receive a statement of symptoms of ill-health with a view to advising for treatment by correspondence.

It is, however, permissible to advertise that a person will receive from someone who states that he knows himself to be suffering from a particular ailment particulars with a view to the supply of some article for its treatment. No such advertisement may refer to any of the ailments included under (a) or to amenorrhoea or to blindness. It is to be noted—

(1) That the offence is the publication of a document; (2) that the intimation must be for *treatment by correspondence*; (3) that the ailments and conditions to which the prohibition applies are limited.

No prosecution can be instituted without the consent of the Attorney-General.

SAVING CLAUSES

There is a saving clause for proprietors, publishers, printers, and distributors of newspapers and periodicals; for printers and distributors of circulars and other documents; for advertising agents; and for the employees of any of them. None of them is liable to be convicted of an offence under the Act if in the ordinary course of his particular business he has taken part in the publication of an advertisement which is illegal under the Act.

There is a further saving clause for a person professing a religious belief in the effectiveness of some means other than medicines or appliances for curing or preventing or exercising a salutary influence upon any of the ailments included under (a) or for curing any of the habits included under (b) in para. 2 of this memorandum. He may hold out the means as being effective for that purpose or he may publish an intimation that someone is prepared to employ that means for that purpose by correspondence. But to avail himself of this defence he must show to the satisfaction of the court that he is acting in accordance with the principles and practice of a religious body comprising a substantial number of persons resident in the United Kingdom who profess that belief, and also that he is authorised in accordance with the constitution of that body to act in that way. This exemption is to cover such treatment as "faith-healing" or prayer. To prevent the rogue taking shelter under it, it is limited to members of organised religious bodies, as, for example, Christian Scientists and Spiritualists.

In the House of Commons on Friday, Feb. 7th, Mr. DUCKWORTH presented the Medicines and Surgical Appliances (Advertisement) Bill which was set down for second reading on March 27th.

In the House of Lords on Thursday, Feb. 6th, the Royal National Pension Fund for Nurses Bill was presented and read a first time.

On Monday, Feb. 10th, in the House of Commons, Mr. TINKER presented the Public Health (Coal Mines Refuse) Bill, the object of which is to amend the Public Health Act, 1875, with respect to coal mine refuse liable to spontaneous combustion.

In the House of Lords on Tuesday, Feb. 11th, the report of Amendments to the Voluntary Hospitals (Paying Patients) Bill was agreed to on the motion of Lord Luke.

HOUSE OF COMMONS

WEDNESDAY, FEB. 5TH

Departmental Inquiry into Workmen's Compensation

Mr. TOM SMITH asked the Home Secretary what progress was being made by the departmental committee inquiring into certain matters connected with the Work-

men's Compensation Act.—Mr. GEOFFREY LLOYD, Under-Secretary of State for the Home Department, replied: I understand that the committee have had several meetings and taken a substantial amount of evidence. A good deal more, however, remains to be heard, and it is not possible at present to forecast when the inquiry is likely to be completed.—Mr. BURKE: Will the hon. gentleman take into consideration the very great difficulty that workmen suffering from silicosis have in making a claim under the Compensation Act?—Mr. LLOYD: That is a matter for the committee.

THURSDAY, FEB. 6TH

Protection of Life from Fire

Mr. GRAHAM WHITE asked the Minister of Health (1) if his attention had been drawn to the loss of life due to recent outbreaks of fire in Edinburgh and Tyldesley; and whether, in view of the fact that in these and other cases escape from burning buildings had been prevented by the destruction of staircases, he would in future, where possible, prescribe and elsewhere recommend that staircases should be constructed from fireproof material; and (2) if it was his intention to introduce legislation for the better inspection of buildings, with a view to reducing the risk of life and damage from fire to a minimum.—Sir K. WOOD replied: My attention has been called to the outbreaks of fire referred to. I have no power to prescribe the method of constructing staircases, but local authorities can deal with the matter by by-laws and have various powers of inspecting buildings. I will consider whether it is desirable to issue any recommendation to local authorities.

Grants for Water-supply

Mr. WELLS asked the Minister of Health (1) the number of applications received in respect of water-supplies and the total amount of grants up to the end of January last, and also the number of grants that had been given for areas where the rates, previous to a proposed scheme, had been under 10s. in the £; and (2) the total number of cases in which applications for grants in respect of water-supplies had been refused.—Sir K. WOOD replied: Up to the end of January last applications had been received in respect of 876 schemes relating to 2227 parishes. Grants totalling £831,000 had been provisionally allocated in respect of 550 schemes for 1707 parishes, including 182 schemes where, previous to the proposed scheme, the rates were less than 10s. in the £. Grants had been refused in respect of 190 schemes on the ground that they were not needed to enable the schemes to be carried out.

Nutrition Surveys

Mr. JOEL asked the President of the Board of Education whether, in view of his departmental circular on free meals and free milk for underfed school-children, he could state whether any education authorities were acting on his advice to hold periodically nutrition surveys at which all children not receiving free meals would be passed under review; and whether he could give the names of such authorities.—Mr. OLIVER STANLEY replied: I understand that certain local education authorities have acted, or propose to act, on the Board's suggestions that periodical nutrition surveys should be held at which children not receiving meals would be passed under review. I am afraid however that I have no information about the number of these authorities, but I understand that the areas in which complete or partial surveys have been or will be held include Swansea, Gateshead, Norwich, Liverpool, and Workington.

Spa Treatment for Health Insurance Patients

Mr. MANDER asked the Minister of Health if he would consider the desirability of arranging that spa treatment should be an additional benefit under national health insurance.—Sir K. WOOD replied: The present list of additional benefits affords to approved societies a wide variety of forms of remedial treatment, and in fact the surplus funds of societies available as a result of the last valuation have already been allocated on this basis. The addition of spa treatment was considered but was not selected. If before the date of the next valuation I have evidence that there is a fairly widespread desire

on the part of societies for the suggested addition, I will give the matter further consideration. Mr. MANDER: Has not the right hon. gentleman recently had a good many representations from societies on this subject? Sir K. WOOD: Yes, Sir, that is so.

Typhoid Fever in Derbyshire

Mr. HOLLAND asked the Minister of Health if he was aware that an outbreak of typhoid fever was affecting a number of persons residing in the village of Langwith, Derbyshire, in the area controlled by the Blackwell rural district council; and what steps had been taken to deal with the matter.—Sir K. WOOD replied: The answer to the first part of the question is in the affirmative. As regards the second part, on the recommendation of my department the previous source of the water-supply to this village has now been abandoned in favour of one which, it is believed, is free from pollution, and I hope that there will be no recurrence of the outbreak.

Mr. HOLLAND asked the Minister of Health if his attention had been drawn to the frequent floodings from a canal on one side and a polluted river on the other of houses situate in Meadow Rams, Pinxton, Derbyshire, endangering the health of the inhabitants and giving rise to great inconvenience; and was he satisfied that proper progress was being made by the Blackwell rural district council in dealing with the matter.—Sir K. WOOD replied: My attention has not previously been drawn to this matter. I will make inquiries.

Mental Treatment

Mrs. TATE asked the Minister of Health what was the increase, if any, in proportion to the population, in the number of persons receiving mental treatment in private homes and State and voluntary hospitals, in the years 1900, 1920, 1930, and 1935 respectively; and whether there was in every case sufficient accommodation for those requiring treatment.—Sir K. WOOD replied: The number of persons per 10,000 of population receiving mental treatment in the places indicated was 25.4 in 1900; 26.3 in 1920; 31.3 in 1930; and 32.8 in 1935. The answer to the second part of the question is in the affirmative, except that in 1930 and 1935 the number of beds available in some public mental hospitals was not sufficient to enable the prescribed standards of bed space to be fully observed. Local authorities in the areas concerned are now actively engaged in providing additional accommodation where needed.

Workmen's Compensation: Medical and Legal Expenses

Mr. T. SMITH asked the Home Secretary whether he would arrange that in future annual statistics on workmen's compensation, legal and medical expenses should be shown as separate items.—Mr. G. LLOYD replied: The returns under the Workmen's Compensation Act on which the annual Home Office statistics are based cover only the compensation paid, and I am afraid that there would be great difficulties in the way of obtaining the amount of the legal and medical expenses incurred by the various parties concerned. So far as regards insurance companies I understand that for the group belonging to the Accidents Offices Association, which includes most of the larger companies, legal expenses are estimated at 2½ per cent. and medical expenses at 1¼ per cent. of the premium income.

MONDAY, FEB. 10TH

Bombing of Red Cross Units in Abyssinia

Mr. WATKINS asked the Secretary of State for Foreign Affairs whether he had any information on how many occasions since the outbreak of hostilities Italian aircraft had bombed Red Cross units in Abyssinia; and whether any British Red Cross units or British subjects serving with Red Cross units had been attacked in this way.—Mr. EDEN replied: According to such information as is available, I understand that the American hospital at Dessie was bombed on Dec. 6th last. On Dec. 30th the Swedish ambulance operating with the Ethiopian forces on the southern front was virtually destroyed by aircraft near Dolo, and on Jan. 4th Ethiopian Red Cross Ambulance No. 1, whose staff includes two British subjects, was bombed and machine-gunned near Dagabur. The

one wholly British ambulance now serving in Ethiopia has not suffered as the result of Italian air action.

Dialling of Emergency Telephone Calls

Mr. DAY asked the Postmaster-General whether, in view of the delay caused at times when dialling O on the automatic telephone exchange in the case of an emergency, he would consider with his engineers whether another dialling signal could be substituted on all automatic exchanges direct to fire, police, and ambulance stations; and if he could say how long it would take to make this alteration in the present telephone equipment, and what would be the estimated cost.—Major TRYON replied: I recently appointed a committee to consider the best means of securing the rapid setting up of emergency telephone calls; and I am afraid it would be difficult to frame estimates such as the hon. Member asks for before receiving their recommendations.

Milk Designations Draft Order

Mr. THOMAS WILLIAMS asked the Minister of Health how many protests had been received by his department concerning the revised draft order, special designations for milk; whether he was aware of the general opposition of all producers of Certified milk and all those agencies who were trying to improve the standard and quality of milk; and if he would consult with interested bodies before the revised draft order came into force.—Mr. SHAKESPEARE, Parliamentary Secretary to the Ministry of Health, replied: My right hon. friend has received very few representations with regard to the revised draft Milk (Special Designations) Order which was published on Jan. 24th. The answer to the second part of the question is in the negative. It is open to any interested parties to make representations to my right hon. friend upon the draft within 40 days of its publication and any such representations will receive full consideration.

Duties of Nurses in Mental Hospitals

Sir FRANCIS FREMANTLE asked the Minister of Health what were the orders or regulations governing off-duty hours and facilities for nurses in mental hospitals; and whether he would inquire into their adequacy, considering the special need in such occupation of daily and weekly change of environment.—Sir K. WOOD replied: The hours of duty and conditions of service for nurses in mental hospitals are determined by the visiting committees of those institutions. The majority have adopted the scheme recommended by the joint conciliation committee representing employers and nurses. An increasing number of local authorities are providing change of environment and recreational facilities by establishing nurses' homes for mental hospital staffs. I am not aware of circumstances indicating the necessity for an inquiry, but if my hon. friend has particular cases in mind, perhaps he will communicate with me.

Resident Chaplains in Mental Institutions

Sir FRANCIS FREMANTLE asked the Minister of Health whether, in view of the value of intelligent and sympathetic ministers of religion in the treatment of mental disease and deficiency, he would take steps to promote the appointment in mental institutions of resident chaplains suited and qualified for the work.—Sir K. WOOD replied: The appointment of whole-time or resident chaplains is within the discretion of the authorities owning mental institutions. The importance of such appointments in large mental hospitals was emphasised in the report of the Board of Control issued last year, and the matter will be brought to the notice of individual authorities as opportunity occurs. I am not, however, empowered to give any direction in the matter.

Milk Act, 1934, to Remain in Force

Sir EDWARD RUGGLES-BRICE asked the Minister of Agriculture what action the Government proposed to take when the main provisions of the Milk Act, 1934, expired at the end of March.—Mr. ELLIOT replied: For several reasons, including the currency of various trade agreements and the fact that the report of the Reorganisation Commission for Milk for Great Britain is not likely to be published for some time to come, it is not possible at present to bring before Parliament long-term legislation for the milk industry. In order to allow adequate time

for the consideration by all parties of the important questions at issue, the Government have decided to ask Parliament to continue until the end of September, 1937, the main provisions of the Milk Act, 1934. A Bill to give effect to this decision will be introduced forthwith.

TUESDAY, FEB. 11TH

Loss of Dangerous Drugs and Poisons

Sir JOSEPH LAMB asked the Home Secretary whether his attention had been called to the increasing number of cases where dangerous drugs and poisons had been lost in transit or stolen from unattended vehicles and to the danger caused thereby to the general public; and what action, if any, he proposed to take in the matter.—Sir J. SIMON replied: There is, I think, no reason to suppose that there has been any increase in the number of such cases, though they have had more publicity of late by reason in particular of the fact that broadcasting is now employed when a loss or theft of this kind is reported to the police and it is thought necessary that the public should be warned by this means. The remedy seems to lie in the exercise of more care and good sense by those concerned, and I hope that the wider publicity will help to achieve that result.

Sir JOSEPH LAMB asked whether, if that did not bring about the desired result, the Home Secretary would bring in more stringent regulations to prevent these happenings.

Sir JOHN SIMON said the hon. Member would see that there would be danger, if they were not careful, of restraining persons from reporting such losses for fear of the consequences to themselves. It was much better that they should report the loss quickly, then the police could be helpful.

Medical Attendance of Arrested Persons

Mr. JAGGER asked the Home Secretary what were the regulations governing medical attendance on persons

detained under arrest at police stations pending appearance before the magistrates; and if he would say whether such arrested persons had the right to see a doctor on request.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: All police forces have instructions to take special care in regard to the treatment of prisoners suffering from illness, to call a doctor to examine any prisoner who complains of illness or shows symptoms of being in a feeble state of health, and to have him removed to hospital if the doctor thinks it necessary. If such a person wished to call in a doctor selected by himself, steps would be taken to meet his wishes if possible, but the police would not wait for a request or complaint from him if they considered that he needed medical attention.

Variola Minor

Mr. BROMFIELD asked the Minister of Health whether he would consider the advisability of making a special investigation of the circumstances attending the outbreak of variola minor which prevailed in certain limited areas of this country during the years 1922–34, with a view to ascertaining what were the causes of its greater incidence in mining areas and whether the disease affected mainly those areas where infant vaccination had declined most.—Sir K. WOOD replied: During the years referred to in the question small-pox occurred in no less than 49 of the 61 counties in England and Wales. The circumstances in which the disease occurred were described in the annual reports of the chief medical officer of my department, and also in a review published in 1931 entitled "A Review of Certain Present Aspects of Small-pox Prevention in relation particularly to the Vaccination Act, 1867 to 1907." The published reports contain full statistics as to the numbers of vaccinated and unvaccinated children, respectively, who contracted the disease, and they afford ample evidence of the value of vaccination as a preventive of the disease. In these circumstances I do not think that any special investigation is necessary.

MEDICAL NEWS

University of Cambridge

The degree of bachelor of medicine has been conferred on W. A. Law and the degree of bachelor of surgery on K. G. F. Mackenzie.

University of London

Four lectures on the endocrine organs in relation to metabolism will be given by Dr. C. Reid on Mondays, March 2nd, 9th, 16th, and 23rd, at University College, Gower-street, W.C., at 5 P.M. The lectures are open to all.

University of Glasgow

On Wednesdays, Fridays, and Mondays from April 15th, in the ophthalmic department of the University, Prof. Arthur Brückner, of Basle, is giving six lectures on physiological optics and their relation to clinical ophthalmology and special clinical ophthalmological problems.

Royal College of Physicians of Edinburgh

A quarterly meeting of the college was held on Feb. 4th with Dr. W. T. Ritchie, the president, in the chair, when Dr. John Philip Cameron (Edinburgh) was introduced and took his seat as a fellow, and Dr. Prag Nath Kapur (Delhi) and Dr. Venkatasubha Mahadevan (Madras) were elected to the fellowship.

Dr. J. G. Greenfield was appointed the Morison lecturer for 1936, Sir Thomas Lewis the George Alexander Gibson lecturer for 1936, and Dr. J. D. Gilruth the Dr. Alexander Black lecturer for 1936.

Royal Faculty of Physicians and Surgeons of Glasgow

At a meeting of the faculty held on Feb. 3rd, with Prof. Archibald Young, the president, in the chair, Dr. Sailes Chandra Guha, of Rangoon, was admitted to the fellowship.

Royal Microscopical Society

At a meeting of this society at B.M.A. House, Tavistock-square, London, W.C., at 5.30 P.M. on Wednesday, Feb. 19th, Dr. G. M. Findlay will read a paper on a new virus disease of mice.

Grants for Scientific Investigations

Particulars of government grants for scientific investigations may be obtained from the clerk to the government grant committee of the Royal Society, Burlington House, London, W.1, and applications should be sent to him not later than March 31st.

Lectures in Hospital Administration

A three months' course of lectures and demonstrations on clinical practice and hospital administration will be given by Dr. J. V. Armstrong at the Brook Hospital, Shooters Hill, Woolwich, S.E., on Mondays, Wednesdays, and alternate Saturdays, beginning on Wednesday, April 1st. Further particulars may be had from the medical officer of health of the London County Council, Public Health Department (Special Hospitals), County Hall, S.E.1.

The Cost of Superstition

The serpent, emblem of the healing art, twined round a staff on the tower of East Grinstead's new hospital is probably to be removed, because it is thought to have brought bad luck to the hospital. The institution was opened less than a month ago and, according to a correspondent in the *Times*, two patients have already died in hospital, the matron has been ill, and it is now recalled that the rain fell in torrents on the day of the opening. It will cost £60 to remove the serpent.

Tuberculosis Conference

The twenty-second annual conference of the National Association for the Prevention of Tuberculosis will be held at the County Hall, London, from July 16th to 18th, under the presidency of Sir Robert Philip, chairman of the council of the association. Subjects for discussion will include: examination of contacts; protection of the adolescent and young adult from tuberculosis; tubercle-free herds; and the need for closer coöperation between the tuberculosis service and the maternity and child welfare service, and possibly the educational authorities. The secretary may be addressed at Tavistock House North, Tavistock-square, London, W.C.1.

Sir Aldo Castellani has been appointed medical adviser to the King of Greece. He is at present on a tour of inspection of the Italian forces in Abyssinia.

Oldham Municipal Hospital

It is proposed to spend £30,000 on enlarging this hospital, as about 40 more beds are required in the general section.

New Health Clinic for Wellington

A new public health clinic has been opened by Lady Forester at Wellington. Part of the clinic will be used for tuberculosis cases and provision has been made for orthopaedic after-care treatment.

Guild of Hospital Librarians

The second annual meeting of this association will be held from May 8th to 11th in La Salle Debussy, 8, Rue Daru, Paris, under the chairmanship of Dr. René Sand. Further information may be had from Mrs. M. E. Roberts, hon. secretary of the guild, 48, Queen's-gardens, London, W.2.

Poisons for Rodents

The University of London Animal Welfare Society is holding a discussion on this subject at the College of the Pharmaceutical Society, 17, Bloomsbury-square, London, W.C., at 5.30 p.m., on Thursday, Feb. 27th. The object of the discussion is to explore the feasibility of selecting and devising poisons with a view to humane considerations. Mr. J. G. Wright, F.R.C.V.S., will deal with the pathological effects of poisons, Mr. J. D. Hamer, F.I.C., will describe chemical rat-control in ships and docks, and Mr. T. Howard will speak on poisoned baits. The general discussion will be opened by Mr. G. D. Lander, D.Sc., and Prof. J. H. Burn, M.D., will be in the chair. Medical practitioners who wish to attend should inform the hon. secretary of the society, 42, Torrington-square, W.C.

Medical Congresses at Wiesbaden

The 27th meeting of the Deutsche Röntgen-Gesellschaft is to be held at Wiesbaden on March 26th, 27th, and 28th, under the presidency of Prof. Hans Dietlen. The first two days of the meeting will be devoted to diagnostic radiology and short-wave therapy, while on the last day physical and technical problems will be discussed. The 48th meeting of the Deutsche Gesellschaft für Innere Medizin is being held at Wiesbaden from March 23rd to 26th under the presidency of Prof. Schwenkenbecher, and on the 26th a joint meeting of the two societies will take place. Dr. Karl Frik, Brückenallee 22, Berlin, N.W. 87, is the secretary of the radiological congress.

Maternal Mortality and Abortion

On Feb. 11th Sir Kingsley Wood, the Minister of Health, received a deputation from the National Council of Women of Great Britain. Its object was to submit to the Minister a resolution urging (1) that the Government should appoint a representative committee to inquire into the incidence of abortion and as to the law and its administration dealing with criminal abortion and attempted abortion, and to consider what measures, if any, are advisable to improve the existing position; and (2) that future official returns should show the deaths attributable to abortion separately from the general figures for maternal mortality. The Minister said in his reply that the high rate of maternal mortality in certain districts had, for some time, been under investigation by medical officers of the Ministry, and before considering any further inquiry he would prefer to await their report, which he hoped to receive before the end of the year. He nevertheless promised that the deputation's statements would be examined to see if any action could usefully be taken in advance of the report. The problem was largely a social one, and he was determined to press on with the measures for slum clearance and abatement of overcrowding on which a good start had already been made. He would also continue to press local authorities to improve their maternity and child welfare services, and particularly to provide adequate antenatal care for pregnant women. A Bill to improve the midwifery service was about to be introduced.

Dr. George Leslie Milburn has been appointed an official member of the Legislative Council of the Presidency of St. Christopher and Nevis.

Society of Radiotherapists

This newly formed society will hold its first clinical meeting at the rooms of the Medical Society of London (11, Chandos-street, W.) on Friday, Feb. 21st, at 4.30 p.m. Mr. Geoffrey Keynes and Dr. W. M. Levitt will open a discussion on the technique of radiotherapy in carcinoma of the breast which has not been previously treated. The hon. secretary of the society is Dr. B. W. Windeyer, Middlesex Hospital, London, W.1.

Tribute to Medical Officer

At a recent meeting of the town council Dr. James Gairdner, who for 56 years has been medical officer for Crieff, received the congratulations of the burgh on attaining his 90th birthday. Dr. Gairdner has always taken a special interest in industrial diseases, and as long ago as 1895 described in his annual report valuable investigations into the composition of metallic furnes and the effects of manganese poisoning.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Feb. 18th.

Medicine. 5 p.m. Dr. Otto Leyton: The Morbid Conditions which Cause Progressive Hyperglycaemic Glycosuria and the Circumstances which Modify its Course. Dr. J. Graham Willmore, Dr. H. P. Hims-worth, and Dr. T. C. Hunt will also speak.

General Meeting of Fellows. 5.30 p.m.

Ballot for election to the Fellowship.

Pathology. 8.15 p.m. (London School of Hygiene, Keppel-street, W.C.) Sir Rickard Christophers: 1. Specimens illustrating *B. knoeckii* (the Parasite of Monkey Malaria). Dr. I. N. Asheshov; 2. Technical Methods Used in Investigation of the Bacteriophage. J. C. Cruickshank; 3. *Bact. typhiflavum*. H. Schwabacher; 4. Desensitisation of Tuberculin-sensitive Guinea-pigs. E. A. Straker; 5. Solubility of Pneumococci in Sodium Hydrate. G. S. Wilson; 6. Modified Methylene Blue Test for the Grading of Milk. 7. Rapid Method for the Quantitative Enumeration of *Bact. coli* and *Bact. aerogenes* in Water.

THURSDAY.

Dermatology. 5 p.m. (Cases at 4 p.m.) Dr. H. W. Barber: 1. Keratosis Pilaris Atrophicans (previously shown). Dr. F. F. Hellier (for Dr. H. W. Barber); 2. Urticaria Pigmentosa. Dr. G. B. Dowling; 3. Schamberg's Disease. Dr. W. J. O'Donovan; 4. Lupus Erythematosus Treated by Radium. Dr. G. W. Bamber; 5. Fibroma with a Typical Epithelial Proliferation. Dr. Elizabeth Hunt; 6. Sebocystomatosis.

Neurology. 8.30 p.m. (Cases at 8 p.m.) Dr. T. Tennent: The Diagnosis and Treatment of Congenital General Paralysis. Dr. J. Brander, Dr. W. D. Nicol, and Dr. R. M. Stewart will also speak.

FRIDAY.

Obstetrics and Gynaecology. 8 p.m. Dame Louise McIlroy: Atresia of the Vagina Operation followed by Pregnancy and Caesarean Section. Mr. A. A. Davis: Intrinsic Dysmenorrhœa. Mr. Malcolm Donaldson, Mr. V. B. Green-Armytage, Mr. Chassar Moir, Mr. B. P. Wiesner, Ph.D., and Prof. James Young will also speak.

Radiology. 8.15 p.m. Prof. H. Chaoul (Berlin): Some Recent Developments in X-ray Therapy. Prof. J. M. Woodburn Morison and Dr. J. F. Bromley will also speak.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.

MONDAY, Feb. 17th.—9 p.m., Dr. P. H. Manson-Bahr: The Differential Diagnosis of Diseases of the Colon (Dysentery and Colitis) and their Complications (first Lettsomian lecture).

CHELSEA CLINICAL SOCIETY.

TUESDAY, Feb. 18th.—8.30 p.m. (Hotel Rembrandt, Thurloe-place, S.W.), Mr. Desmond MacManus and Mr. Cecil Rowntree: Consultations.

SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Thorn-lough-street, W.C.

FRIDAY, Feb. 21st.—5 p.m., Dr. W. M. Ash: Prevention of River Pollution.

Maternity and Child Welfare Group.—8.30 p.m., Dr. Andrew Topping: Certain Factors Influencing Maternal Mortality and the Part Played in Combating them. *Tuberculosis and Dental Officers' Groups.*—8 p.m., Discussion on Dental Treatment of Tuberculous Patients.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, Manson House, 26, Portland-place, W.
THURSDAY, Feb. 20th.—8.15 P.M., Dr. R. Lewthwaite: Recent Work on the Typhus-like Fevers of Malaya.

TUBERCULOSIS ASSOCIATION.
FRIDAY, Feb. 21st.—5.15 P.M. (Manson House, 26, Portland-place, W.), Dr. H. H. Scott and Dr. C. H. C. Toussaint: Primary Tuberculosis in Children and its Relationship to Meningitis. 8.30 P.M., Sir Henry Gauvain and Mr. G. R. Girdlestone: The Treatment of Tuberculous Lesions of Bones and Joints.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.
WEDNESDAY, Feb. 19th.—4 P.M. (St. James' Hospital, Ouseley-road, S.W.), Dr. George Graham: Treatment of Diabetes.

SOCIETY OF RADIO THERAPISTS.
FRIDAY, Feb. 21st.—4.30 P.M. (11, Chandos-street, W.), Mr. Geoffrey Keynes and Dr. W. M. Levitt: The Technique of Radiotherapy in Carcinoma of the Breast which has not been previously Treated.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.
MONDAY, Feb. 17th, **WEDNESDAY** and **FRIDAY**—5 P.M., Dr. John Beattie: Temperature Regulation (Arris and Gale lectures).

UNIVERSITY OF LONDON.
FRIDAY, Feb. 21st.—11 A.M. (London School of Hygiene, Keppel-street, W.C.), Dr. W. G. Savage: Food Poisoning.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.
WEDNESDAY, Feb. 19th.—4 P.M., Mr. A. Clifford Morson: Fads and Fancies in the Treatment of Prostatic Obstruction.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.
TUESDAY, Feb. 18th.—5.30 P.M., Dr. T. F. Cotton: Mitral Disease and its Treatment.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
WEDNESDAY, Feb. 19th.—2 P.M., Mr. James Crooks: Tonsils, Adenoids, and Accessory Air Sinuses. 3 P.M., Dr. A. Signy: Bacteriology of Tonsillitis.
 Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, Feb. 17th.—3.30 P.M., Dr. Kinnier Wilson: Some Heredo Familial Diseases (I.), Extra Pyramidal (II.).
TUESDAY—3.30 P.M., Dr. Critchley: Cerebral Vascular Disease (IV.).
WEDNESDAY—3.30 P.M., Dr. Kinnier Wilson: Clinical Demonstration.
THURSDAY—3.30 P.M., Mr. Leslie Paton: Optic Atrophy.
FRIDAY—3.30 P.M., Dr. Purdon Martin: Poliomyelitis.
 Out-patient Clinic daily at 2 P.M.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, Feb. 17th.—10 A.M., Medical wards and skin clinic. 11 A.M., Surgical wards. 1.30 P.M., Gynecological wards. 2 P.M., Surgical wards, gynecological and eye clinics. 4.15 P.M., Mr. Green-Armytage: Sterility.
TUESDAY—10 A.M., Medical wards. 11 A.M., Surgical wards. 2 P.M., Throat clinic.
WEDNESDAY—10 A.M., Children's ward and clinic. 11 A.M., Medical wards. 2 P.M., Eye clinic. 4.15 P.M., Lecture on anaesthesia.
THURSDAY—10 A.M., Neurological and gynecological clinics. Noon, Fracture clinic. 2 P.M., Eye and genito-urinary clinics.
FRIDAY—10 A.M., Skin clinic. Noon, Lecture on treatment. 2 P.M., Throat clinic.
SATURDAY—10 A.M., Surgical and children's clinics, medical wards.
 Operations, medical and surgical clinics daily at 2 P.M.
 The lectures at 4.15 P.M. are open to all medical practitioners without fee.

ST. JOHN CLINIC, Ranelagh-road, S.W.
FRIDAY, Feb. 21st.—4.30 P.M., Mr. Martin Oldershaw: Some Chronic Causes of "Rheumatism" in Women.

LONDON SCHOOL OF DERMATOLOGY, 5, Lisle-street, W.C.
TUESDAY, Feb. 18th.—5 P.M., Dr. S. E. Dore: Pruritus, Prurigo, and Lichenification.
WEDNESDAY—5 P.M., Dr. I. Muende: Histopathology.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Feb. 17th, to **SUNDAY**, Feb. 23rd.—**CHELSEA HOSPITAL FOR WOMEN**, Arthur-street, S.W. All-day course in gynecology.—**NATIONAL TEMPERANCE HOSPITAL**, Hampstead-road, N.W. Tues., 8.30 P.M., Mr. R. Y. Paton: Deformities. Thurs., 8.30 P.M., Mr. David Patey: Liver, Spleen, and Pancreas.—**ST. JOHN'S HOSPITAL**, 5, Lisle-street, W.C. Afternoon course in dermatology.—**PRINCESS ELIZABETH OF YORK HOSPITAL**, Shadwell, E. Sat. and Sun., course in children's diseases.
 Courses are open only to members and associates of the fellowship.

LEEDS GENERAL INFIRMARY.
TUESDAY, Feb. 18th.—3.30 P.M., Mr. Pain: Common Foot Complaints in General Practice.

LEEDS PUBLIC DISPENSARY.
WEDNESDAY, Feb. 19th.—4 P.M., Dr. S. J. Hartfall: Influenza.

UNIVERSITY OF DURHAM.

SUNDAY, Feb. 23rd.—10.30 A.M. (Newcastle General Hospital), Mr. A. Logan: Surgical Cases.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY, Feb. 19th.—4.15 P.M. (Royal Infirmary), Dr. J. Ferguson Smith: Some Infective Diseases of the Skin.

Appointments

London County Council Hospital Staff.—The following appointments, promotions, and transfers are announced. A.M.O. (I.) and (II.)=Assistant Medical Officer, Grades I. and II.

SHEEHAN, J. P., M.D., M.R.C.P. Irel., A.M.O. (II.), Bethnal Green;

KIRMAN, B. H., M.B. Lond., A.M.O. (II.), Constance-road Institution;

YOUNG, R. M., M.D. Edin., A.M.O. (II.), Constance-road Institution;

RAMSAY, A. M., M.B. Aberd., A.M.O. (II.), Fulham;

JONES-DAVIES, T. E., M.R.C.S. Eng., A.M.O. (II.), Highgate;

DIMSON, S. B., M.D. Lond., D.T.M. & H., A.M.O. (II.), Highgate;

MCGREGOR, C. B., M.B. Glasg., D.P.H., High Wood Hospital for Children;

MATHESON, I. W., F.R.C.S. Eng., A.M.O. (II.), Mile End;

DICKIE, A. E., M.B. Glasg., A.M.O. (II.), Mile End;

SIMON, E. L., M.B. Lond., A.M.O. (II.), St. Charles';

FOX, R. W. S., M.B. Melb., A.M.O. (II.), St. Charles';

BOYLE, A. K., M.B. Glasg., A.M.O. (II.), St. George-in-the-East;

ROWLANDS, E. A., M.B. Melb., F.R.C.S. Eng., A.M.O. (I.), St. Mary, Islington;

MERSON, G. P., M.B. Aberd., A.M.O. (II.), St. Olave's;

LAWSON, W. S. G., M.B. Lond., A.M.O. (II.), St. Pancras;

TULLIDGE, G. M., M.B. Lond., D.T.M. & H., House Physician, High Wood Hospital for Children;

EVANS, W. G., M.B., D.P.H., House Physician, North-Western;

ORPWOOD, R. M. M. C., M.R.C.S. Eng., D.P.H., House Physician, Queen Mary's Hospital for Children;

PEARSON, H. E. S., M.B., M.R.C.P. Lond., A.M.O. (I.), St. Mary, Islington;

GREEN, R. D., M.B., M.R.C.P. Lond., A.M.O. (II.), St. Pancras;

FLATLEY, G. D., M.B. Belf., A.M.O. (I.), Mile End.

Certifying Surgeons under the Factory and Workshop Acts:
 Dr. W. F. MASON (Bradford (Cleckheaton) District, Yorks (West Riding)); Dr. R. MCC. PATERSON (Shepshed District, Leicestershire); Dr. R. L. UNSWORTH, (Westhoughton District, Lancashire); and Dr. GAVIN BROWN, (Mochrum District, Wigtown).

Births, Marriages, and Deaths**BIRTHS**

BARKER.—On Feb. 1st, at a nursing-home, the wife of Dr. A. N. Barker, Maidstone-road, N., of a son.

HOLMWOOD.—On Feb. 7th, at Aldermaston, Berks, the wife of L. S. Holmwood, M.R.C.S. Eng., of a son.

LEANING.—On Feb. 2nd, in Edinburgh, the wife of Capt. R. R. Leaning, R.A.M.C., of a daughter.

LEVI.—On Feb. 5th, at Woodchurch-road, N.W., the wife of David Levi, M.S. Lond., F.R.C.S. Eng., of Harley-street, W., of a daughter.

ORR.—On Jan. 25th, at Neyyoor, Travancore, India, the wife of Ian M. Orr, M.D. Glasg., F.R.C.S. Edin., of a son.

SHAW.—On Feb. 7th, at Welbeck-street, to Mary Michael Shaw, M.B., B.S., wife of C. C. Shaw, B.Arch., A.R.I.B.A.—a son.

SUTHERLAND.—On Jan. 31st, at Bath, the wife of Dr. Alister Sutherland, of a daughter.

MARRIAGES

GRIFFITHS-WRIGLEY.—On Feb. 1st, at the Congregational Church, Buxton, Griffith John Griffiths, B.Sc., M.B. Lond., of Colwyn Bay, to Nancy Bryceson Wrigley, elder daughter of Mr. W. F. Wrigley of Buxton.

STEVENSON-GLUCK.—On Feb. 1st, at London, John Black Stevenson, M.C., M.B. Glasg., of Sanderstead, Surrey, to Marie Gluck, daughter of the late I. Gluck, Esq., of London.

DEATHS

BALLANCE.—On Feb. 8th, at St. John's Wood Court, N.W., Sir Charles A. Ballance, K.C.M.G., M.S. Lond., F.R.C.S. Eng.

BOSWELL.—On Feb. 6th, at York-avenue, East Sheen, S.W., Alexander Boswell, M.D. Aberd., aged 82.

LEECH.—On Feb. 7th, 1936, Priestley Leech, M.D. Lond., F.R.C.S. Eng., the dearly loved husband of Emmie Milson Leech, in his 74th year. Was laid to rest in St. Paul's Churchyard, King Cross, Halifax, Feb. 10th, 1936.

MAITLAND.—On Feb. 6th, at Dudley, Vivian Gray Maitland, M.R.C.S. Eng., D.P.H. Dub., in his 58th year.

MILNER.—On Feb. 4th, in London, Major Arthur Edward Milner, M.R.C.S. Eng., late R.A.M.C., in his 68th year.

PINCHIN.—On Feb. 7th, at Gledhow-gardens, S.W., Arthur John Scott Pinchin, M.D., F.R.C.P. Lond., aged 59.

WILLIAMS.—On Feb. 7th, at Barry Port, Carmarthenshire, John Henry Williams, L.S.A. Lond., M.P., Carmarthenshire, Llanelly Division.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

FURNITURE FOR CONVALESCENCE

CONVALESCENT homes too often carry the hospital tradition into what should be a holiday atmosphere. At the new convalescent home for children, built under the Zachary Merton trust for the Royal Manchester Children's Hospital, the furniture has been specially designed by Heal's to please the imagination of the child returning to health. The beds are of iron, and run on strong wooden castors, but there their likeness to hospital beds ends, for the smooth half-moon of iron at the head and foot of each bed is coloured green with cellulose paint, and bears a fine large picture of a country flower—a different flower for each bed, painted by hand, not a single design transferred interminably. The cots are green, too, each again with its special flower, and both sides of the cot can be lowered smoothly with no crashing of hinges or damage to nurses' insteps. The beds are sprung with strong chain springs, impervious to bouncing, and in addition to a good hair mattress each child has a feather pillow and a pillow of feather and down. Over the beds are spread wool rugs designed in shades of green, and at every bedside is a cupboard of weathered oak with a towel rail and a green top of cork and rubber composition on which the evening milk can be spilt and not one tear need be shed about it. The dining tables and play tables of strong and simple pattern have the same perdurable surface, but in a colour in harmony with the weathered oak of which all the furniture is constructed. The sturdy chairs are in two sizes, for longer and shorter patients. In the day-rooms the large toy cupboards have half-moons of wood for handles and roomy shelves. The book-cases are low and stout so that they can be climbed upon without damage to themselves and fallen off without damage to the climber. Sun couches with adjustable backs, wheel-chairs, and glass cupboards and trolleys for surgical equipment are the only things which recall the hospital a little; but even the ironwork of the cupboard is painted green. The comfort of the nurses has been equally considered. Their box-spring beds have a little bookshelf in the oak headpiece and a concealed light under its upper border. Such furniture as this has a look of summer even on a February day, and fully carries out the determination of Messrs. Heal and Son to avoid the hospital atmosphere. It is on view at their show-rooms in Tottenham Court-road, London, until Feb. 21st.

CHEST RADIOGRAPHY

A YEAR ago Messrs. Watson and Sons, Ltd., invited inspection of a new condenser set for radiography of the chest. One of these sets, installed on approval in a London hospital, has taken about 12,000 radiograms with little trouble and much efficiency. The principle of the condenser discharge is not new but has been revived in this set owing to the large current that can now be passed through a Rotalix tube for a thirtieth of a second without damage to the focus. The set is shock proof, the mechanical parts and tube being totally enclosed in a metal cabinet. It takes up 6 ft. 5 in. by 2 ft. 11 in. by 9 ft. 2 in. high. The advantages of this type of construction are briefly: (1) it is simple in operation; (2) variation in film density is controlled solely by variation of kilo voltage; (3) no time switch is required; (4) patients, no matter of what size, can be radiographed in the same exposure time of 1/30 sec.; (5) the level of the tube from the floor is fixed, the patient being centred by raising or lowering a platform electrically.

The quality of the radiographic detail is of a high order, showing a "soft" picture with a wealth of detail. Nine variations of penetration are provided, a "tail" being provided which gives a slightly increased exposure time per stud. In practice it is found that studs Nos. 1 and 2 are of no value. No. 3 has been used for children, 4, 5, and 6 for normal

adults according to their thickness, studs 7, 8, and 9 only being required for stout patients. Anterior views are taken at a distance of 5 ft., since at this distance the machine gives the requisite blackening in a patient of average build. The hope of obtaining views of comparable density in radiograms of the same subject taken at intervals was not realised, although it would be unfair to attribute such difference as arises to the set itself when other factors are present such as alteration in weight of the patient, change in dark-room technique, or screen speed.

Certain disadvantages have been noticed in practice: (1) The limited number of available variations of penetration, the lower studs being too low for present-day screen speed; the gaps between successive studs represent a change of 5 k.v. per stud. (2) The 5 ft. distance at which the radiograms are taken is a non-standard distance; a disadvantage in cardiac work. (3) The exposure factors are only sufficient to produce a lateral radiogram of the chest at a distance of 3 ft. in a patient of small build. (4) Patients cannot be X rayed in the erect position unless able to stand; many would be steadier and more comfortable in the sitting position. (5) The set cannot be used for stereoscopic work.

The manufacturers deserve credit for having produced so serviceable a plant, and no doubt in future models they will meet some at least of these difficulties. Many patients are able to sit up to be radiographed at a time when they are unable to stand. With more variations of penetration and smaller gaps between them it should become practicable to adjust penetration more exactly to the patient's thickness. It seems likely that the problem of obtaining penetrating views and lateral radiograms will be solved more easily when faster films or intensifying screens are available.

SMALL BOOKS ON GREAT MATTERS

THREE more of Cassell's "Health Handbooks," under the general editorship of Dr. A. D. Baker, have recently been published at 1s. each. The first, by Dr. G. J. V. Crosby, is concerned with "Insomnia and Disordered Sleep," the causes of which are classified as physical, psychical and mixed. Certain obvious extraneous causes such as noise or cold feet account for still another group. Among the physical causes the author rightly places high blood pressure; he calls this a disease of modern civilisation and large communities, whereas it is common enough among unhurried persons in rural areas. He also revives the boggy of auto-intoxication from a loaded bowel, an injudicious resurrection with which to confront an already purgative-ridden generation. Somewhat sweepingly he asserts that intoxication by the poisons of typhoid, acute fevers, syphilis, lead, and tobacco, if untreated, lead to hardening of the arteries. Though sound on the sleep requirements of children he perhaps exaggerates the significance of "the mysterious and frightening manifestations of puberty" which are surely nowadays for the most part properly dealt with. There is a short chapter on somnambulism and nightmares and appended to each chapter is a summary of conclusions.

In these days of infant welfare clinics the feeding and management of babies have been so thoroughly worked out that they are no longer very disputatious matters. "Healthy Babies," by the Hon. Mrs. Noel Olivier Richards, M.D., is a simple, authoritative, and practical little book with which it is difficult to find fault. Not everyone will endorse the view that weaning may be postponed till the twelfth month or even later. Prolonged suckling is undoubtedly a strain on some otherwise healthy women. The author advocates that when the baby is put to sleep out of doors it should lie in a secluded place free from interruption "by visitors

and out of reach of dustbins, brooms, drains, or kitchens or the dust from the road." Cats might have been added to the list. Dr. Richards takes the sensible view that masturbation in the young child should be ignored and that the tendency to examine and explore should not be discouraged. Perhaps, however, she over-emphasises the need to protect the small child from physical dangers. Any parent who has watched his or her offspring clambering upstairs or climbing into a high-chair will have been struck with the degree of native caution it displays if left to itself.

The third volume, entitled "Birth Control," is contributed by Dr. Helena Wright, and might well have been confined to practical matters, whereas it contains much propaganda in it. Some of the statements made seem over-dogmatic; for instance, that "there is no way of conducting a reasonable happy married life without a method of controlling the number of children," and again "the cap and chemical take about two minutes to place in position . . . and no harm results to the woman concerned if this technique is used every night for an indefinite number of years." On both of these points, picked at random from the book, it would seem impossible to make such a definite pronouncement at the present time. In her discussion of the problems of limiting the size of families Dr. Wright makes no mention or allowance for the rapid decline in natural fertility which is apparently occurring in the Western races. Although there will not be universal agreement among doctors that the best techniques have been here described, the book has undoubted merit. It is written in concise and simple style and its arguments and the descriptions of such methods of birth control as are advocated by the author are easy to follow.

A NEW FORM OF MERCURY ARC

THE mercury arc as we know it to-day has altered little since the early discoveries of Arons, Cooper Hewitt, Kuch, and others. The "atmospheric" type of burner made it unnecessary to tilt the tube, to strike the arc by applying external heat, but the mercury lamp still remained as a discharge between two massive pools of mercury. A new type of arc has recently been placed on the market by Messrs. Hanovia Ltd., which employs a new system of starting, though the final quality of output remains unchanged. This burner is based on the recent work of Spanner, and consists of a simple quartz tube containing a very little mercury, a certain amount of the rare gas argon, and is fitted with special electrodes of "activated" metal. When switched on, a spark discharge is established which rapidly heats up the electrodes until they are emitting electrons in the same way as the filament of a thermionic valve generates electrons. As the temperature rises the mercury is volatilised and the spark discharge passes into the normal mercury arc.

The new burner does not require tipping to start it and will burn in any position. It has other advantages over the standard type. Owing to the absence of the heavy reservoirs of mercury the tube is far less fragile and can be sent by post if well packed. The time taken for the establishment of full output is considerably less than with the standard type, probably because of the smaller quantity of heat needed. The new arc can run equally well on alternating and direct current, and since the alternating supply is becoming universal this is of great importance. The old form of three-electrode tube for A.C. never proved as satisfactory as the D.C. type.

As regards output a 15 per cent. increase is claimed on a reduced current. The quartz of the tube suffers the same progressive deterioration as has been observed in all other mercury arcs, but a new compensating rheostat has been incorporated by which the current can be pushed up after the burner has been in use for a certain number of hours.

It will be found that these advantages are reflected in the price, but the manufacturers are offering special terms for replacement of old burners.

THE GLAXO LABORATORIES

THE transfer, from cramped and adapted town premises to a spacious semi-rural site, of a manufacturing concern based on scientific control is a vast undertaking. The Glaxo company is to be congratulated on the successful way in which they have done this. A site of 15 acres at Greenford—that classic spot where Perkin discovered the first aniline dye—has given opportunity for considered and ordered design, an opportunity which has not been lost.

A long well-lighted very modern building with only one floor above ground level is arranged so that raw materials brought in at one bay, adapted for easy unloading of lorries, pass through the various processes in their way across the factory part of the building to a dispatch bay, without confusion or unnecessary handling: In some cases raw material is brought to the upper floor so that it may be ground, sieved, mixed with other products or otherwise treated; so the final preparation then gravitates to the lower level where it is divided into appropriate measured or weighed units and put in suitable containers for sale and use. All this necessary preparation is done with the minimum of effort and with proper regard to cleanliness, but without the eyewash of redundant precautions designed to make an impression on visitors.

The substances prepared at Greenford include vitamins A, B₁, B₂, C, and D, parathyroid extract, the oestrogenic hormone, ergot alkaloids, pituitary extract, and antiviruses and similar bodies; many of them are sent out in admixture with suitable food products or mineral constituents which may be deficient in the human body and form useful adjuncts to the organic preparations. Milk and malt products and cod-liver oil of guaranteed potency are also handled at Greenford. Most of the products mentioned can only be offered with confidence to medical men and their patients if their activity and composition can be guaranteed as suitable and reasonably constant in batches made or sold at different times. The greater part of the upper floor of the Greenford laboratories is therefore devoted to control and research.

The chemical laboratory consists of one large room where research and analytical control goes on side by side. This arrangement which, although not usual, is followed in some other large laboratories, such as those at County Hall, has the advantage of enabling the scientific staff to survey the whole of the work and ensures the pooling of knowledge, experience, and initiative, besides easing the dislocation caused by sickness or holidays. Chemical control is supplemented by physical examination where this is of service, as, for example, in the spectrometric assay of vitamin A.

Chemical or physical examination suffices for some purposes and in others enables batches of material to be packed ready for issue, but where the question of activity is important, as in the case of vitamins, actual issue is delayed until experiments on animals have shown that the preparation is up to standard. For this purpose a large animal department is kept up, in which thousands of white rats of the well-known Wistar strain are bred and stored, both for sale to research workers and for experiments in the laboratory itself. Besides the laboratories mentioned others are devoted to bacteriology and the preparation of vaccines.

The occupation of the new laboratories was carried out very carefully; an illustrated pamphlet was distributed among the workers before the move was effected, and everyone could see from it where he would be working and how to get there, besides finding his way to any part of the building which might concern him. When a visit was paid to Greenford, a

few weeks after the move, everyone seemed as "native and to the manner born"; the obvious newness of the building and some plant erection which was going on were the only signs that the place had not been running smoothly for years.

SPECIMENS IN THE POST

FEW parcels can be more unpleasant, if not dangerous, in the post than material badly packed and sent for pathological examination. To prevent the risk of infecting Post Office servants and of contaminating the mails, the Postmaster-General has drawn attention—he says he has reason for doing so—to the conditions for sending specimens. The material must be in a hermetically sealed or securely closed container, placed in a strong case with enough absorbent packing to prevent movement and any possible leakage. It must be clearly labelled "Pathological specimen. Fragile, with care," and sent only by letter post. If a packet fails to conform to these regulations it is at once destroyed with all its wrappings and enclosures, and the sender is liable to prosecution.

A DISCLAIMER

Drs. David and Robert Thomson write to disclaim responsibility for the publicity given to an article which they and Mr. E. T. Thompson recently wrote on giving vaccine by mouth. "The lay press's interest in colds and influenza," they say, "is so great that it is almost dangerous now for a doctor to publish an article on the subject except in some obscure medical journal."

Vacancies

For further information refer to the advertisement columns

All Saints' Hospital, Austral-street, West-square, S.E.—Res. H.S. At rate of £100.

Archway Hospital, Archway-road, N.—Asst. M.O. £250.

Barnby, Caernarvonshire and Anglesey Infirmary.—Sen. and Jun. H.S.'s. At rate of £150 and £100 respectively.

Bath and Wessex Children's Orthopaedic Hospital, Combe Park.—H.S. At rate of £120.

Birmingham, Queen's Hospital.—Sen. Res. Anæsthetist. At rate of £70-£100.

Birmingham, Romsley Hill Sanatorium.—Res. Asst. M.O. At rate of £240.

Birmingham, St. Chad's Hospital.—Jun. Res. M.O. At rate of £150.

Blackburn, Queen's Park Hospital and Institution.—Res. Jun. Asst. M.O. At rate of £150.

Bolton Royal Infirmary.—Res. Surg. O. £250.

Bradford, Municipal General Hospital, St. Luke's.—H.P.'s and H.S.'s. Each at rate of £150.

Brighton, Royal Sussex County Hospital.—Second Asst. Pathologist. £450.

British Postgraduate Medical School, Ducane-road, W.—Two First Assts. for Dept. of Surgery. Each £250-£500.

Cambridge, Adlenbrooke's Hospital.—H.S. At rate of £130.

Cancer Hospital, Fulham-road, S.W.—Res. M.O. for Radium Dept. At rate of £100.

Carlisle, Cumberland Infirmary.—Second H.S. At rate of £155.

Central London Ophthalmic Hospital, Judd-street, W.C.—Sen. and Jun. H.S. £120 and £100 respectively.

Chelsea Hospital for Women, Arthur-street, S.W.—Registrar (Gynecological) and Radium Officer. £75.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—Asst. Laryngologist.

Constance-road Institution, East Dulwich, S.E.—Asst. M.O. £250.

Coventry and Warwickshire Hospital.—Res. Cas. O. £125.

Eastbourne, Princess Alice Memorial Hospital.—Hon. Anæsthetist.

Egyptian Government.—Director of Lunacy Division in P.H. Dept. L.E. 1020 to L.E. 1200.

Evelina Hospital for Sick Children, Southwark, S.E.—H.P. At rate of £120.

Forest Gate Hospital, Forest-lane, E.—First Asst. Res. M.O. £525. Also Second Asst. Res. M.O. £350.

Gloucestershire Royal Infirmary, &c.—H.S. to Ear, Nose, and Throat Dept. At rate of £150.

Halifax Royal Infirmary.—Third H.S. At rate of £150.

Hampstead General and N.W. London Hospital, Haverstock Hill, N.W.—Cas. Surg. O. for Out-patient Dept. At rate of £100.

Hertford, Ware Park Sanatorium.—Asst. M.O. £300.

Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Surg. Reg. £100. Also Clin. Asst. to Ear, Nose, and Throat Dept.

Hull Royal Infirmary.—First H.S. £150.

Ilford, West Ham Mental Hospital, Goodmayes.—Jun. Asst. M.O. £350.

Ipswich, East Suffolk and Ipswich Hospital.—H.S. £144.

Ipswich Mental Hospital.—H.P. £150.

Kingston upon Hull City and County.—Asst. M.O.H. £600.

Leicester County Sanatorium and Isolation Hospital, Markfield.—Jun. Res. M.O. At rate of £300.

Lewisham Hospital, High-street, S.E.—Asst. M.O. £350. Also Asst. M.O. £250.

Lincoln County Hospital.—Jun. H.S. At rate of £150.

Liverpool, Bootle General Hospital.—H.P. and H.S. Each at rate of £150.

London Fever Hospital, Liverpool-road, N.—Anæsthetist.

Manchester, Booth Hall Hospital.—Jun. Asst. M.O. At rate of £200.

Manchester, Duchess of York Hospital.—Sen. Res. M.O. At rate of £125.

Manchester Royal Children's Hospital, Gartside-street.—Two Asst. M.O.'s for Out-patients' Dept. Each at rate of £150.

Manor House Hospital, Golders Green, N.W.—Jun. M.O. £200.

Metropolitan Hospital, E.—Hon. Surgeon. Also Surg. Reg.

Middlesex County Council.—Tuber. M.O. £750. Tuberculosis Sanatorium, South Mimms. Deputy Med. Supt., &c. £450.

Middlesex Hospital, W.—Anæsthetist. Also Asst. Anæsthetist. £100.

Miller General Hospital, Greenwich-road, S.E.—Cas. O., Out-patient Officer. Each at rate of £150. Also H.P. & H.S. Each at rate of £100.

Mount Vernon Hospital, Northwood.—H.S. At rate of £150.

National Hospital, Queen-square, W.C.—Res. M.O. £200.

Nelson Hospital, Merton, S.W.—Two Res. H.S.'s. Each at rate of £100.

New End Hospital, Hampstead, N.W.—Asst. M.O. £250.

Nottingham General Hospital.—H.S. for Fracture and Orthopaedic Depts. £300. Also H.S. to Ear, Nose, and Throat Dept. At rate of £150.

Plymouth, Prince of Wales's Hospital, Greenbank-road.—H.S. and H.P. Each at rate of £120.

Preston, Biddulph Grange Orthopaedic Hospital.—Jun. H.S. At rate of £200.

Prince of Wales's General Hospital, N.—Res. Jun. H.P.'s and H.S.'s. Each at rate of £90. Also Hon. Med. and Surg. Regs. Each £100.

Princess Beatrice Hospital, Richmond-road, Earl's Court, S.W.—H.S. and H.P. Each at rate of £110.

Queen's Hospital for Children, Hackney-road, E.—H.P. and Cas. O. Each at rate of £100.

Rochdale Infirmary and Dispensary.—Second H.S. £150.

Royal London Ophthalmic Hospital, City-road, E.C.—Sen. Res. O. £150.

Royal Naval Medical Service.—Eight vacancies.

St. Andrew's Hospital, Devons-road, E.—Asst. M.O. £250.

St. Bartholomew's Hospital Medical College.—Sen. Demonstrator in Dept. of Pathology. £400.

St. George's Hospital, S.W.—Asst. Bacteriologist. £500.

St. Leonard's Hospital, Hoxton-street, N.—Asst. M.O. £250.

St. Luke's Hospital, Sydenham-street, S.W.—Asst. M.O. £250.

Salisbury Royal Hospital.—Hon. Asst. Gynecologist.

Salisbury General Infirmary.—H.S. At rate of £125.

Southampton, Isolation Hospital and Sanatorium.—Jun. Res. M.O. £200.

South Eastern Hospital for Children, Sydenham, S.E.—Jun. Res. M.O. At rate of £100.

South London Hospital for Women, Clapham Common, S.W.—H.P. At rate of £100.

Stoke-on-Trent, North Staffordshire Infirmary.—Radium Officer. £500.

Swansea County Borough.—Asst. M.O. £500.

Tancred's Studentships.—Three. Each £100.

University College Hospital, Gower-street, W.C.—Bilston Pollard Fellowship. £650.

Warrington County Mental Hospital, Winwick.—Asst. M.O. £500.

Warwickshire County Council.—Asst. County M.O.H. £500.

Westminster Hospital, Broad Sanctuary, S.W.—Obstet. Tutor and Reg. £100.

West Riding of Yorkshire, Middleton-in-Wharfedale Sanatorium.—Res. Asst. M.O. £350.

Whitechapel Venereal Diseases Clinic, Turner-street, E.—Director. £1250.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Rhondda (Porth) (Glamorgan), Cowbridge (Glamorgan), and Larkhall (Lanark).

ROYAL HALIFAX INFIRMARY.—Increased funds are needed at this hospital if the standard of efficiency is to be maintained. During the year 22,372 patients were treated, an increase of 1603 on the previous year, and the average cost of each in-patient was £6 8s. 4d. Workpeoples' contributions for the first time exceeded £10,000, and the paying patients' ward produced £4750.

INDEX TO "THE LANCET," Vol. II., 1935

THE Index and Title-page to Vol. II., 1935, which was completed with the issue of Dec. 28th, is now ready. A copy will be sent gratis to subscribers on receipt of a post card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

ADDRESSES AND ORIGINAL ARTICLES

JOHN HUNTER TO JOHN HILTON*

BY C. H. FAGGE, M.S. Lond., F.R.C.S. Eng.,
F.R.A.C.S. (Hon.)

CONSULTING SURGEON TO GUY'S HOSPITAL, LONDON

"It would be well, I think, if the surgeon would fix upon his memory as the first professional thought which should accompany him in the course of his daily occupation this physiological truth—that Nature has a constant tendency to repair the injuries to which her structures may have been subjected, whether those injuries be the result of fatigue or exhaustion, of inflammation or accident."—JOHN HILTON—"Rest and Pain."

In any attempt to assess a teacher's claim to greatness we must consider the influence he exerts upon his pupils.

In his Hunterian oration of 1921, Sir Charters Symonds¹ traced the influence of Hunter upon the surgery of the succeeding generation in the person of Sir Astley Cooper; it will be my endeavour to link up the teaching of John Hunter with that of John Hilton—with one of a generation later than that of Astley Cooper. The Hunterian lesson did not come direct to John Hilton—Hunter had been in his grave more than thirty years when Hilton went to Guy's. But Cline of St. Thomas's was one of his most ardent disciples and Astley Cooper of Guy's was himself a pupil of Hunter, and further, worked under Cline from whom, as Sir Charters Symonds has told us, he derived the spirit which Hunter inculcated.

It is no disadvantage to my purpose that Astley Cooper and John Hilton were in many respects dissimilar. Astley Cooper was a man of fine presence, courtly manners, and an operator of enterprise and dexterity. When we attempt to conjure up his personality we cannot escape from the influence of Lawrence's portrait which hangs in our council chamber and in which the silk knee-breeches and swallow-tailed coat proclaim the aristocrat of mind as well as of bodily form. Hilton was broad, short, and brusque in manner. In appearance he suggested a successful man of business in the city rather than a scientific surgeon: he wore the heavily braided

broadcloth of early Victorian days, with a flowered waistcoat and widely open collar. Hilton had no chance to become an assured operator, but as a scientific investigator and thinker he was much more closely in accord with Hunter's traditions than his illustrious predecessor. I venture to think that Hilton more fully understood their significance, and pursued his inquiries in a scientific spirit which Astley Cooper had not at his command.

John Hilton, the eldest son of John and Hannah Hilton, was born in 1805 at Sible Hedingham in the county of Essex, and was educated at the grammar school (now known as King Edward VI.'s School), Chelmsford, and at Boulogne. During his boyhood his parents were in poor circumstances; in later years his father's interest in the straw-plaiting industry prospered, but at the time John Hilton

went to Guy's in 1824 he could not afford to purchase an apprenticeship to a member of the staff, so that, when twenty years later he was elected assistant surgeon, he was the first member of the surgical staff of any London hospital whose appointment had not been "bought and paid for."

During his studentship Guy's medical school separated from that of St. Thomas's and Hilton, appointed in 1828, was the second demonstrator of anatomy in the new medical school: he taught in the dissecting-room for sixteen years and gained the nickname of "Anatomical John."

Hilton was a member of the surgical staff of Guy's from 1844-70. In 1843 he was one of the 300 original fellows of this College to be elected under the terms of our third Royal Charter; he was vice-president from 1865-67, and was elected president in 1867, serving for one year only as was customary in those days. He died of cancer of the stomach at

Hedingham House, Clapham Common, on Sept. 14th, 1878.

In his obituary notice of Hilton, Mr. Jacobson has little to tell us of his youth and upbringing.² Mr. Jacobson's essay is, in my judgment, the equal of his better known essay on Arthur Durham³; this latter was obviously a labour of love and showed Jacobson at his very best. His ease of diction, the purity and simplicity of his prose, and his unerring aptitude of quotation gained for the writer a place which no



John Hilton

* Part of the Hunterian oration for 1936 delivered before the president and council of the Royal College of Surgeons of England on Feb. 14th.

¹ THE LANCET, 1921, i., 359.

² Jacobson, W. H. A.: Guy's Hosp. Rep., 1892, xlix., 37.

³ Jacobson, W. H. A.: Ibid., 1895, lii., 43.

other of my teachers at Guy's at the end of the last century could contest.

In the former essay Jacobson argues that success in life without the help of a good education, money, or influential friends stamps a man as above the common, and quotes Hilton as an example. What little he tells us of Hilton's student days includes the story of a dinner which after the separation of Guy's from St. Thomas's in 1826 was held annually and which was the origin of the United Hospitals Club, a dining-club which still flourishes after celebrating its centenary in 1928. To this dinner in one of his later student years Hilton was bidden. The habits of those days were unchecked by the conventions of to-day, and as chair after chair became vacant, either by the guest leaving, or finding repose under, the table, Hilton moved up until he reached a seat of honour at one side of the chairman, Benjamin Travers.

Contemporary events must have had a great influence upon the mind and career of John Hilton. His childhood was, without doubt, darkened by the spectre of the "Corsican Ogre" who dominated Europe until the year 1815 saw his overthrow. Those whose youth has been spent in the shadow of the Great War and the hardships of the succeeding years will have sympathy for Hilton whose own boyhood, rather more than a century earlier, must have been deprived of the few luxuries which might have been possible had not England been in the trough of a world-wide trade depression.

Another event which must have had a most important effect upon his career was the Anatomy Act of 1832. A previous Bill to amend the law relating to the supply of bodies for dissection had been opposed in 1829 by a petition from the president and council of this College, who considered it "injurious to the interests and advancement of the profession of Surgery and to the Rights of your Petitioners." Largely owing to the activity of Sir Astley Cooper the amended Bill, which became law in 1832, was altered to comply with the views of the College. William Hunter had been the first British anatomist to provide opportunities for individual dissection by students, when he founded his school in 1746,⁴ this innovation, it has been said, was the greatest debt—and that of many—which surgery owes to William Hunter. But in spite of this, anatomical knowledge made little progress largely owing to the precarious supply of material.

In the same year as Hilton was appointed demonstrator of anatomy, the action of Bransby Cooper *v.* Wakley took place. Hilton's part in this can only have been a passive one yet, this group of Guy's surgeons shows that even at that date he had acquired some repute as an anatomist.

It is difficult to believe that only a hundred years separate us from the time when such errors in taste as are here depicted and what would now be regarded as contempt of court were permissible, yet there is no reason to suppose that our manners and conventions will appear any more acceptable to the educated classes of a century hence than are those of a hundred years ago to us. When we consider the increased rapidity of travel, and the easy interchange of thought and experience which the scientific discoveries of the past century have rendered possible, it is interesting to reflect that at Waterloo in 1815 the rival armies moved at no greater speed than

could prehistoric warriors who had subjected the wild horse to domestic use; there had till that date been no speeding-up in communications between different parts of the world.

In 1825 George Stephenson's steam-engine was first used for passenger and goods traffic on the Stockton-Darlington line. We have perhaps as yet scarcely realised the influence of the ever-increasing rapidity of communication of modern times upon the fortunes of the British Empire, and it is doubtful whether those who were witnesses of early steam locomotion could visualise the effect it would produce upon nations and upon the progress of knowledge throughout the world.

John Hilton as an Anatomist

One of Hilton's chief claims to the approbation of posterity is the dissections which he made in order that Joseph Towne should copy them in wax. Towne's wax models, which include the most beautiful and best known anatomical models in the world, also depict many varieties of skin disease and certain morbid processes. They are nearly one thousand in number and most of them adorn the museum of Guy's Hospital; it is remarkable that the colour and consistency of the wax still remain unchanged after a lapse of over one hundred years.

Joseph Towne,⁵ the son of a dissenting minister at Royston, came to London by coach to obtain the opinion of an anatomical authority upon the accuracy of a wax model of a human skeleton which he had fashioned secretly at night. It is stated that he had never seen a complete human skeleton. Knowing no one in London he knocked by chance at the house of a doctor in Hackney who gave him an introduction to Sir Astley Cooper; in the year 1826, at the age of 17, he became modeller to Guy's, two years before Hilton began to teach anatomy. His appointment, so far as I can discover, was made by Benjamin Harrison, on his own responsibility, for the minutes of the governors' committee contain no record of Towne's election. Benjamin Harrison—whose despotism gained for him the name of "King" Harrison—was the Guy's treasurer whose strong hand and sound judgment of men guided so wisely in its early years the fledgling⁶ which had just left the parent nest. Towne was a great artist, even though he was entirely self-taught. His model in wax of a skeleton gained the first silver medal of the Society of Arts, and is now in the Guy's Hospital museum. He was awarded the gold medal of the Society of Arts in 1827 for a model in coloured wax of the human brain, one of a series which is "read up" by all Guy's students. Towne served Guy's for over 50 years—in fact, probably till the date of his death in 1879. He worked alone in a locked room and the secret of his methods died with him.

Hilton was a pioneer in the accurate and detailed description of topographical anatomy, of which he was one of the first to show the value to any young man who aimed at distinction as a surgeon. It is well for this College to bear this in mind as there are those who, never having had any degree of insight into this subject, question its practical application to surgery. In Hilton's day the modern textbook of descriptive anatomy did not exist; such books as there were for the medical student in 1824⁷ contained a smattering of superficial anatomy,

⁴ Bryant, T.: Guy's Hosp. Rep., 1883, xii., 1.

⁵ Guy's separated from St. Thomas's in 1826 in part; the final separation took place in 1849.

⁷ Bell, John: The Anatomy of the Human Body, 1803.

⁶ William Hunter took over Sharpe's School and lectureship in 1746, and established his own school in Great Windmill-street in 1770.

strongly interlarded with physiology of an elementary type, and any observations on comparative anatomy as seemed to be even remotely relevant to the structure which was being described.

In the year 1839 Hilton was made a Fellow of the Royal Society, chiefly for his work on the superior



Wax model of skeleton made by Joseph Towne.

laryngeal nerve of man; from his dissections of this and other nerves in man he evolved Hilton's law—which states that a nerve supplying the muscles which control the movement of a part also supplies the skin or other sensory surface which overlies that part. In later work he elaborated this theory in a most important relation when he showed that the nerves, supplying the muscles controlling a joint and sensation to the skin over the joint also supply the structure of the joint itself. He writes: "The same trunks of nerves, whose branches supply the groups of muscles moving a joint, furnish also a distribution

of nerves to the skin over the insertions of the same muscles; and the interior of the joint receives its nerves from the same source."

Hilton does not appear to have thought of pursuing this idea or to have been alive to the obvious deductions arising out of this discovery—for it is not until 1876 that Ferrier's work on monkeys established the presence of cortical centres. This led ultimately to the conception that the association of motor and sensory tracts could be carried much further back to the cerebral cortex where it has been shown that the centres for associated functions are in close anatomical relationship.

Hilton's work "On the Cranium" is less well known than his other anatomical writings, but in some ways it is even more worthy of notice. Part of this book, which is founded on his anatomy lectures delivered at Guy's, appeared in the *Guy's Hospital Reports* just before their temporary demise in 1853.⁸ This interruption was the reason for their separate publication.

Its opening paragraphs disclose the foundation of his anatomical beliefs—the dependence of structure upon function or, as Hilton himself puts it, "Nature's universal precision in adapting means to ends." The capacity of the author to extract points of interest, even from dry bones, is apparent in every line—thus the frontal sinuses act as a natural protection to the brain in adults which is absent in children. The superciliary ridges, with the eyebrows,

serve the purpose of diverting the "sweat of the brow" of the working man from passing over the eyeball when it would obstruct his vision. Frequent attention is drawn to physical signs of surgical importance—e.g., the meaning of a depressed or raised anterior fontanelle in a baby. To our generation Hilton's unceasing endeavour to explain the form and position of every structure by its alleged function is somewhat tiresome, but allowance must be made for his teleological views.

He disposes of phrenology by pointing out the dissimilarity between the exterior of the skull and the surface of the brain, and makes observations upon the function of the cerebro-spinal fluid, though it will be noticed that he had no conception of its purpose save as a purely mechanical buffer for the brain or as a substance which could replace, or be replaced by, an equivalent volume of blood. To establish this belief he performed a series of experiments on the cadaver and showed that when he forced blood into the cranial cavity there was "an afflux of cerebro-spinal fluid into the spinal canal."

He is in doubt whether the clear fluid which escapes from the ear of a boy with a fractured base is cerebro-spinal fluid, so he compresses the jugular veins to promote intracranial congestion, and is convinced that the increased flow of fluid from the ear is conclusive evidence that it is cerebro-spinal fluid.

He is much interested in the various ridges of compact bone which pass in all directions along and across the base of the skull; he attributes to them the function of transmitting vibrations from falls on the vertex or those carried upwards from the spine, and devises an experiment which confirms his view that the petrous portion of the temporal bone plays a very important part in collecting these vibrations and diverting them from any deleterious influence which they might exert upon the brain. Hilton's teaching inculcates the value of observation; for on a visit to Gloucester Cathedral he finds "similarity in a portion of its structure to the position of the vomer in the nasal cavities."

From 1845 to 1853 Hilton lectured every weekday at 2 P.M.; in the same year as he began to lecture on anatomy Dr. Gull was appointed the first lecturer on physiology in the Guy's medical school. Hilton's interest in topographical anatomy is evidenced by his teaching in the dissecting-room, and by the actual dissections which he prepared for Towne, but in addition the scientific aspect of anatomy attracted him. So his lectures, like those of all his contemporary anatomists, lean markedly towards teleology, which, strengthened by the recent publication of the Bridgewater treatises, reigned supreme in the London schools of his day.

John Hilton as a Surgeon

The sudden death of Aston Key, senior surgeon to Guy's Hospital, of cholera, in 1849, made John Hilton a full surgeon at the age of 44—in current parlance "gave him his beds," for in those days the assistant surgeons at Guy's had charge of out-patients only.

At that time Lister had not yet given his message of hope to suffering humanity. Primary union rarely occurred—a ligature was left long with its ends hanging out of the wound; dry lint and strapping were the first dressing. Moreover, anaesthesia was in its infancy, for the use of chloroform as an anaesthetic by inhalation had been advocated by James Simpson only two years previously.

⁸ A new series began in 1855.

Hilton held the post of surgeon to Guy's until 1870, there being no age limit at that date.⁹ He gained the reputation of being a cautious scientific surgeon—not prone to any operation which did not promise well for his patient. It is unlikely that he acquired any degree of dexterity or brilliance, for, as has been noted, he had no operative experience as a young man—the smaller hospitals which now abound in and around our large cities and which provide welcome nurseries for the young surgeon of to-day being at that date unheard of. Nevertheless, his attitude towards surgery is demonstrated by his ability to introduce a new method for opening a deeply seated abscess; in his own words, “cut with a lancet through the skin and cellular tissue and fascia . . . then push a grooved director . . . into the swelling.” “A blunt instrument such as a pair of dressing forceps is then run along the groove in the director into the swelling, when by separating the handles you may ‘so tear open the abscess.’”

He is of opinion that such a “lacerated track” will not close prematurely. This is still known as Hilton's method.

In Jacobson's opinion² his imperishable claim to be remembered as a great scientific surgeon rests on the sound blending of anatomy and physiology in his teaching. For it was as a clinical teacher that John Hilton made his surgical reputation; he brought to this task the same spirit of inquiry as had characterised his earlier scientific work. “However chronic and uninteresting, however trite and trifling seemed the case, he had the power of getting information out of it.” He was constantly inquiring the reason for symptoms and signs, and allotting to each a significance which did not appear obvious to others, yet, when mentioned by the master, seemed to be peculiarly apt.

“Rest and Pain”

In the years 1860 to 1862 Hilton was professor of anatomy and surgery to the Royal College of Surgeons; in this capacity, known after 1868 as Arris and Gale lecturer, he delivered annually six lectures, which, in book form, became his classic¹⁰—familiarily known as “Rest and Pain.”

Hilton's classification of Rest as Mechanical and Physiological, clearly defines two distinct and separate conditions not necessarily of similar aim or of equal value. Physiological rest does not imply immobility; for instance, the heart or stomach obviously cannot be brought to rest, yet rest for both these organs may be attained by the acquisition of a state of eased function favourable to recuperation and repair. He points out that repair can only occur satisfactorily when the part affected is in complete repose and that pain is the common danger signal that rest is necessary.

In these days of scientific instruments of precision, the practitioner of medicine is apt to fail to attach due importance to those features of a sick patient which are open to his own observation. Yet Hilton's dictum that every pain has its distinct and pregnant significance if we will but carefully search for it, still remains “the whole truth,” and every medical man, however small his experience, must realise that pain is, above all other symptoms, the one for the

relief of which a doctor is consulted. Therefore, it is scarcely possible to overrate the clinical value of pain. Keith¹¹ writes: “If Hilton's first service to surgery was to give ‘rest’ a foremost place in the means of treatment, his second was to give ‘pain’ its rightful place in the means of diagnosis.”

Hilton's teaching showed the way in which the clinical value of pain may be assessed—i.e., by careful and precise observation. He draws a tragic picture of our first parent ejected from the Garden of Eden, confronted by “his first wound, his first experience of pain,” with the recent denunciation “Thou shalt surely die” still ringing in his ears. He shows that all life needs periods of rest, and quoting John Hunter as an authority on this matter in relation to plants, asks, “What would have been the condition of man on earth had it pleased the Creator to withhold from him this power of repairing his injured tissues?”

He emphasises the value of sleep as a therapeutic agent, especially for children. One of Hilton's most valuable clinical observations was in relation to the fixation in flexion of an inflamed joint. To quote his own words: “When the interior of the joint is in a state of inflammation or of irritation, the influence of this condition is carried to the spinal marrow, and thence reflected to the various muscles of the joint, through the medium of the associated motor nerves, the muscles being supplied by the same nerves that supply the interior of the joint.” A fixed joint is thus produced and this fixation is only relaxed under anaesthesia. He writes further: “the flexors by virtue of their superior strength, compel the limb to obey them, and so force the joint into its flexed condition”—the joint thus becomes rigid and flexed.

Here Hilton made a pathological observation of considerable physiological importance; his was a forecast or original thought upon a subject which was as yet imperfectly or only partly understood. It is true that in 1833 Marshall Hall¹² had described “excito-motor” (reflex) actions, but his hypothesis embraced only the muscular response to the excitation of a sensory surface. To Hilton must be attributed the originality of the conception that abnormal stimuli from a joint—the seat of injury or disease—can influence the position of the limb through the action of muscles which owe their innervation to the same nerve trunks as those which supply the joint.

Again, in the same paragraph he notes that the skin over an inflamed joint is very sensitive; thus he describes the condition which we now know as cutaneous hyperaesthesia and considers it to be a result of the distribution of the same nerves to the joint and to the skin over it. He shows that the distribution of the auriculo-temporal nerve leads to the association of earache and toothache with unilateral furring of the tongue—a “functional and structural deterioration depending upon nerve influence.”

As was only to be expected Hilton's explanations or conclusions in relation to the causation of many affections have not stood the test of time. It is more amazing that much of what he wrote still seems true, and that his foresight in regard to function was so accurate. His trend is always to supply a mechanical reason for a physiological or pathological process. This is only natural in the latter case as he

⁹ The minutes of the general court of governors of Guy's Hospital show that the regulation making 60 the age limit of the members of the staff was passed in 1853. This would, of course, not apply to those members of the staff elected before that date.

¹⁰ Hilton, John: On the Influence of Mechanical and Physiological Rest, 1863.

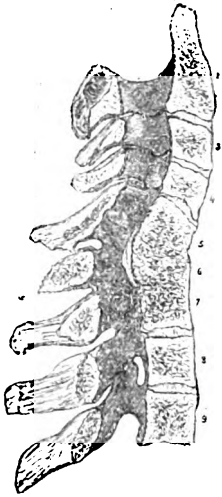
¹¹ Keith, Sir A.: *Memoirs of the Maimed*. London, 1919, vol. x., p. 29.

¹² Hall, M.: *On the Reflex Function of the Medulla Oblongata and Medulla Spinalis*, 1833.

did not foresee the rôle of bacteria in the causation of disease; for instance, he answers the question, "Why does a surgeon open an abscess" by the statement "To give its internal surfaces rest," and insists that such an opening must be situated "at its lowest part."

He was much interested in the case of John Carter, a man of 21, who had fallen from a tree when in the pursuit of young rooks. He had sustained a "crush fracture" of the bodies of the fifth, sixth, and seventh cervical vertebræ and a complete transverse lesion

of the spinal cord at the same level, with the result that he had total loss of power and sensation in his legs, trunk, and arms. He lived for fourteen years after the accident and earned his livelihood by drawing with a pencil or pen held between his teeth. A reviewer in the *British Medical Journal* of 1863 wrote of "Rest and Pain": "that Mr. Hilton's lectures are perhaps the most considerable contribution to surgical literature furnished by any of the professors of surgery who have occupied the Chair of the College of Surgeons since Sir James Paget's celebrated lectures on 'Inflammation' in 1850." It is open to question whether Hilton's lectures



A vertical section of John Carter's spine.

have not had the more lasting influence on surgical progress. In regard to style, Hilton has no superior among medical writers: his characteristics are the simplicity, purity, and vividness of his English.

Sir Arthur Keith's opinion of the work of Hilton is shown in his book "Menders of the Maimed," of which the first chapter is devoted to John Hunter and the second to John Hilton. He shows how the practice of Hilton's principle of rest has helped humanity. Surgeons are slow to learn lessons. In the late war one of the commonest causes of death after gunshot fracture of the thigh bone was shock. It was not at first realised that this was due to defective immobilisation during transport, yet this factor disappeared or at least dwindled into insignificance so soon as the Thomas's knee splint—itsself an apparatus well known for many years—was restored to favour. Here was merely an illustration of the old lesson which Hilton taught.

His deductions from his physiological experiments on pain led him to advocate certain lines of treatment. Such a sequence of thought should be the scientific basis of all therapeutic measures.

John Hilton and Modern Surgery

John Hilton's thesis that the surgeon should rely on nature's ability to secure healing of many lesions provided that the injured part has been put under the favourable conditions of absolute physiological rest is necessarily followed by the corollary that the surgeon should be satisfied with the minimum of active interference:

Hilton did not and could not be expected to foresee the impetus to surgery which Lister's work has

afforded—shortly to be multiplied a thousandfold by the advent of aseptic surgery which was a logical outcome of Listerism.

Modern surgery has not abandoned the principle of physiological rest—rather has it recognised its value and has increased the number and complexity of the procedures by which that state may be attained. It would be instructive to discover how far those who were responsible for the introduction of the various short-circuiting operations—such as gastro-jejunosotomy, that for the production of a pneumothorax, or the fixation of a limb in plaster for the resting of paralysed muscles—appreciate that they were merely following the principle laid down by Hilton when he insisted on the therapeutic value of physiological rest.

Reference has already been made to the value of anatomy in surgery, and while operative dexterity depends upon anatomical exactitude in most operations rendered possible by recent advances, it must be admitted that the dissecting-room is no longer as it was in Hilton's day the sole or in fact the most important path to surgery. A comprehensive knowledge of physiology, not only in theory, but also by experimental methods, has become essential to the surgery of progress. It is perhaps strange that Hilton should have gained the reputation of being the best anatomist in London, whereas if John Hunter must be regarded as the first British physiological surgeon, Hilton has supreme claims to be ranked as his immediate successor.

John Hilton as Hunterian Orator

In the year 1867 John Hilton delivered the Hunterian oration; he was at that time the senior vice-president of this College.

In his oration Hilton postulates that Hunter's trustees—Matthew Baillie and Everard Home—in establishing the oration, had a much higher object in view than the mere laudation of Hunter . . . "their main object," he writes, "was to perpetuate in our profession the mind that was in Hunter . . . to inspire Hunter's successors with the same ardour of professional pursuit." He goes on to inquire what "manner of mind" Hunter was possessed of, and is of opinion that its essential and outstanding attributes were its industry, inquisitiveness, and common sense.

Hilton emphasises an aspect of Hunter's position which does not appear to have been given its due weight, and that is "the solitariness of his pursuits—the want of a single mind to sympathise with his large and exalted view of the grandeur of animate nature—which must have had a chilling influence on his enthusiastic temperament. We shall fail to appreciate the full measure of Hunter's mental stature if we do not recognise the difficulties under which he toiled."

Hilton's Hunterian oration deals chiefly with sympathy—which would, in modern scientific language be termed referred pain—and gives as an example the pain at the end of the urethra occasioned by a stone in the bladder; he contrasts the theories of Darwin and Hunter in explanation of such phenomena and attempts to prove that they harmonise with his own work on the physiology of pain. He points out that Hunter had observed that in affections of the hip or the loins, "the sympathising pain is felt in the knee before it is felt in the original seat; he shows that accurate knowledge of the distribution of the obturator, anterior crural and sciatic

nerves to the hip and knee joints sufficiently explains what Hunter was driven to veil under the covering of sympathy." He passes on to make several original observations upon the reflex sympathies of which the 5th cranial nerve provides the afferent and efferent paths, and remarks in explanation of Hunter's observation that in diseases of the liver pain is referred to the right shoulder—"the shoulder sympathises with the liver but the liver never sympathises with the shoulder." He explains this sympathy on the assumption that the right phrenic arising from the 3rd and 4th cervical nerves (which also supply the skin over the point of the shoulder) gives off a branch into the porta of the liver.

Hilton further reminds us that nature has a remarkable power of recuperation; if we do not prevent her she can bring about the patient's recovery; at times it may be that she needs our aid, and when this is so he endeavours to point out the lines upon which this assistance should be based. This is, after all, only what Hunter taught. Keith¹¹ writes: "Were I to cite the most important contribution Hunter ever made to surgery, it would be his clear recognition of the fact that restoration is effected by powers inherent in the living tissues of the patient; the surgeon can only help recovery by tending these powers."

Hilton had advanced in outlook and breadth of knowledge in the years between his "Rest and Pain" and his Hunterian oration, yet apparently he does not dream of bacterial activity in disease when he accepts the Hunterian idea of sympathy as a large factor in the causation of tetanic spasms, although he admits that the pathology of this disease "is still indefinite."

When Hilton thought and wrote about matters of supreme importance he showed a disbelief in Darwinian evolution. His views may be gathered from a sentence in his oration¹³ before the members of the Hunterian Society. "When we approach the consideration of life itself or the spirit we are restrained by our finite reason. All is darkness to the human understanding." "... These are mysteries ... as inscrutable alike to the sage and to the savage ... they are left in doubt purposely to make us set a right value upon all human science."

Here is the faith of this successor to Hunter, whose work for surgery and influence upon surgical thought have seemed worthy of our remembrance upon a day dedicated to the homage of his master.

¹¹ Lond. Med. Gaz., 1844, xxxiii., 673.

HOSPITAL COÖRDINATION IN LANCASHIRE.—The Lancashire public assistance committee has appointed a special subcommittee to consider whether the control of public assistance hospitals should pass from the committee and be given to the county council public health and housing committee.

Dr. F. de B. Pim, whose death was announced at the end of January, retired from practice in the Barrowford and Nelson districts some two years ago. He was prominently associated with the St. John Ambulance movement and was a Knight of Grace of the Order of St. John. For over 50 years he worked for the Ambulance Association becoming the foremost figure in the district, and to commemorate his 50 years' service a presentation of money and plate was made to him. One cup he gave to be held as a challenge cup between ambulance centres of Lancashire, and another for competition among police ambulance centres.

EXPULSIVE FORCE OF THE UTERUS DURING LABOUR*

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"My father, who dipped into all kinds of books . . . had found out, that the lax and pliable state of a child's head in parturition, the bones of the cranium having no sutures at that time, was such,—that by force of the woman's efforts, which, in strong labour-pains, was equal upon an average, to the weight of 470 pounds avoirdupois acting perpendicularly upon it,—it so happened, that in 49 instances out of 50, the said head was compressed and moulded into the shape of an oblong conical piece of dough, such as a pastry-cook generally rolls up in order to make a pie of.—Good God! cried my father, what havoc and destruction must this make in the infinitely fine and tender texture of the cerebellum! . . . But how great was his apprehension, when he further understood, that this force acting upon the very vertex of the head, not only injured the brain itself, or cerebrum,—but that it necessarily squeezed and propelled the cerebrum towards the cerebellum, which was the immediate seat of the understanding!—Angels and ministers of grace defend us! cried my father,—can any soul withstand this shock?—No wonder the intellectual web is so rent and tattered as we see it; and that so many of our best heads are no better than a puzzled skein of silk,—all perplexity,—all confusion within-side."—("Tristram Shandy," Book II.)

THUS wrote Laurence Sterne nearly two hundred years ago, and in this revelation of obstetrical mysteries he presumably reflected the beliefs which were at one time held regarding the expulsive power of the uterus during parturition. The proposition that the foetal head is subjected to a force equivalent to 470 lb.—the weight of three ordinary men—was indeed calculated to awaken a lively interest. We can well understand the doubts and fears which assailed Tristram's father, and can sympathise with him when he enlisted Dr. Slop's aid and planned by exercise of obstetric art to circumvent these destructive forces, and to bring a less vulnerable part of his future offspring's anatomy to bear as Nature's battering-ram.

With the lapse of time more rational views came to be held regarding the expulsive powers of the uterus, and there is no doubt that the magnitude of the forces at work was enormously over-estimated. Many endeavours have been made to measure the precise force exerted by the parturient uterus. Matthews Duncan¹ tested the bursting strain of foetal membranes and from it deduced the expulsive power of the uterus. In more recent times various workers have measured the tone of the uterine wall by an external apparatus and from this have calculated the intra-uterine tension. Most direct and convincing of all the methods is the introduction of a hydrostatic bag into the uterine cavity itself and the measurement of the changes of pressure which are transmitted to this bag. As far back as 1872 Schatz² obtained a mechanical recording of the uterine contractions of labour by this means, and his records give an indication of the true intra-uterine tension. Some years ago Bourne and Burn,³ by a similar method, carried out a systematic investigation of uterine activity during labour, and studied the response of the uterus to drugs and anaesthetics. It will be recalled that they used a small uterine bag which could be inserted between the foetal membranes and the uterine wall high above the presenting part. This bag was connected by water-filled tubing to a mercury manometer which traced the variations of intra-uterine pressure on a slowly

* From the department of obstetrics and gynaecology of the British Postgraduate Medical School, incorporating work previously done in the obstetric unit of University College Hospital, London.

revolving drum. The records obtained by this method showed clearly the characteristics of the first and second stage labour pains and their approximate force.

Findings Obtained by the Intra-uterine Bag Method

I have repeated much of Bourne and Burn's work on the uterine forces during labour, and can corroborate their findings.⁴ During the contractions of the first stage of labour the intra-uterine tension is increased by a pressure equivalent to 35-60 mm. of mercury; 45 mm. mercury may be regarded as an average figure (Fig. 1). During the second stage of labour the contractions continue as before, and their magnitude, as a rule, is not greatly altered. In exceptional cases as, for example, after injection of pituitary extract, the tension may increase by as much as 90 mm. of mercury. A prominent new feature can be seen in the tracings obtained during the second stage: large, sudden increases of intra-uterine tension occur with the acme of each uterine contraction, and are the result of the bearing-down efforts of the patient. This "secondary expulsive power" is extremely important because, although intermittent and of short duration, it has the effect of doubling the previous intra-uterine tension. To be more exact, the additional pressure produced is the equivalent of 40-50 mm. of mercury (Fig. 2).

It is a curious fact that similar experiments made before the onset of labour pains will show the presence of uterine contractions equal, or almost equal, in magnitude to those of parturition. While these painless contractions of late pregnancy appear to differ from those of true labour only in their less frequent occurrence, it may well be that subtle differences of quality are also present, such as altered neuromuscular mechanism or retraction of the fundus uteri, which the method of recording does not reveal. It is interesting to recall that rupture

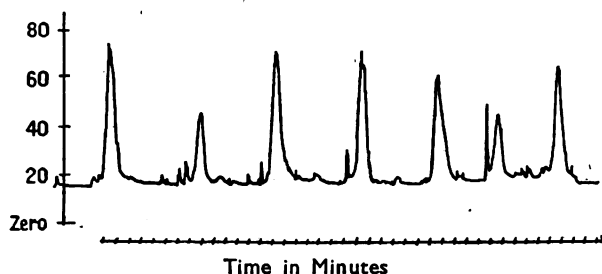


FIG. 1.—Tracing made with intra-uterine bag showing first stage labour contractions. Pressures in mm. Hg.

of the uterus occurring in the weak scar of a previous Cæsarean-section wound is an accident which happens, as a rule, not in the late stage of labour, but in the early first stage, or even during the last few weeks of pregnancy before recognisable labour pains start. This fact is readily explained by the findings just mentioned.

One small refinement in the method of recording must be mentioned. In the experiments described the deflated bag is inserted into the uterus, and the fluid pressure in the recording system is then raised to a level sufficient to cause the bag to be comfortably filled to its normal capacity of 10 c.cm. of fluid (I have always used a pressure of 25 mm. of mercury for this purpose). Recording can now begin and, as already indicated, the force of the uterine contrac-

tions above the resting tension can be measured with reasonable accuracy. Thus far, however, no allowance has been made for this resting tension of the uterus. For various reasons it cannot be measured directly. During the rest intervals the level of the tracings—i.e., the fluid pressure in the recording system—is maintained (1) by the support given to the fluid by the stretched rubber walls of the bag itself; (2) by the intra-uterine tension acting on the

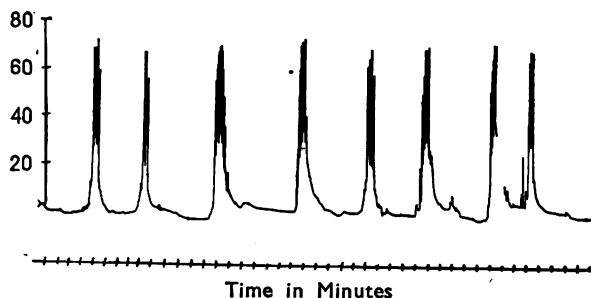


FIG. 2.—Tracing made with intra-uterine bag showing second stage contractions. The dark upstrokes showing the uterine contractions are due to the bearing-down efforts of the patient. (Note: the zero level of pressure was not determined in this case, and the pressures are in consequence measured from the resting tension of the uterus.)

bag. Only the last mentioned is of interest, and it can be measured by subtracting the first; this is done by withdrawing the bag *still fully distended* from the uterus and marking on the recording chart the level to which the pressure then falls. This zero mark is shown in Fig. 1, and from it the measurements of tension are taken.

It can now be said that the pressures recorded are, on the average, as follows:—

Resting tension	15 mm. mercury.
First stage contractions plus resting tension	60 mm. "
Second stage contractions plus resting tension plus secondary expulsive force ..	105 mm. "

These measurements may be accepted as giving a generally satisfactory answer to the problem of intra-uterine pressure during labour. Certain objections, however, have been raised to the method. In particular, it has been said that the presence of a foreign body in the uterus acts as an irritant, and so produces an abnormal uterine activity. For these and other reasons an alternative method of measuring uterine powers is desirable.

A New Method of Measuring Intra-uterine Tension

The possibility of using a method which would dispense with the need for an intra-uterine bag occurred to me when watching a patient during the third stage of labour. As usual in such circumstances, each uterine contraction caused the clamped stump of the umbilical cord to become tense with blood forced into it from the squeezed placenta. Here, surely, was Nature's own intra-uterine bag with tubing presented ready for connexion to a recording manometer. Experiments soon showed that while records of uterine contractions could be obtained by these means, the observations were often marred by the partial or complete expulsion of the placenta from the fundus uteri. It was, however, an easy step to apply the new method to

a twin pregnancy and to use the placental end of the cut cord of the first delivered fœtus to record the pressures acting on the second fœtus in utero. The method is as follows:—

After delivery of the first fœtus the cord is clamped and cut as usual. The umbilical vein of the placental portion of the cord is then opened and a few c.cm. of blood allowed to escape. A small quantity of sterile sodium citrate solution is then injected into the vein in order to prevent clotting. The volume of the injected fluid should be rather less than the amount of blood which previously escaped. A glass cannula is now tied into the umbilical vein and connected by thick rubber tubing containing citrate solution to a mercury manometer which stands at the side of the bed level with the patient's uterus. The mercury column of the manometer carries a small float which presses on a slowly revolving drum in the usual

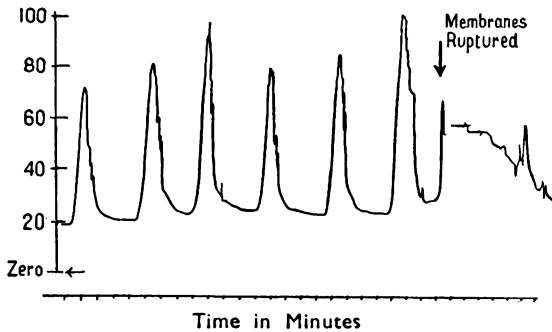


FIG. 3.—Record made by umbilical-cord method, showing pressures acting on the second fœtus of a twin pregnancy.

manner, and which thus records in graphic form the variations of intra-uterine pressure.

After setting up the apparatus a mark is made on the chart to indicate the resting position of the mercury column or zero pressure. The clamp on the rubber tubing is then released, and at once the mercury column rises to a level which represents the resting uterine tension. With each uterine contraction the mercury column rises and records a wave which is precisely similar in type to those recorded by the intra-uterine bag (Fig. 3).

The tracing which is reproduced shows the highest pressures which have been registered by this method. The resting pressure is equivalent to 25 mm. of mercury, and the uterine contractions increase this by 75 mm. of mercury, thus causing, in all, a pressure of 100 mm. of mercury to be recorded. It will be seen that the tracing is typical of first stage contractions, and, inasmuch as the second fœtus was still above the pelvic brim, this was indeed the stage of labour to which the patient had reverted at the time the recording was made. It is not usually possible to record second stage contractions because the fœtal head is then in the pelvic cavity, and the umbilical cord consequently compressed. This happened with the rupture of the membranes in the example shown.

Certain minor criticisms may be made of this method of determining pressures. (1) The pressure in the umbilical vein is, in part, the result of the tension of the fœtal vessels themselves. This causes the measurement of the resting uterine pressure to be exaggerated. The error is, however, probably small, and can be lessened by allowing the blood which escapes from the cord to be a few c.cm. in excess of the injected citrate solution. It is obvious that the method will give accurate measurements only when the circulations in the two placentas do not communicate—i.e., a binovular pregnancy. This can be ascertained after completion of labour. (2) The pressures

recorded are those produced by a partly retracted uterus acting on the second fœtus, and are not necessarily the same as those which obtain when the uterus is fully distended, for the following reasons: (a) the reduced size of the uterus makes its spherical curvature greater, and this, if other things remain equal, would result in a higher internal pressure; (b) added to this, the walls of the uterus are now thicker, and can presumably exert a greater contractile force per unit area than they could in the thinned-out condition. It is a common clinical observation that, whereas the uterus often shows a state of comparative inertia during the birth of the first of twins, it will, when it resumes activity after retraction, show a more vigorous behaviour during the delivery of the second fœtus and cause its expulsion in a very short time. The possibilities just mentioned under headings (a) and (b) give a reasonable explanation of this, and they also explain why, in the example shown, the pressures recorded were distinctly higher than those obtained by the intra-uterine bag method used in cases of single pregnancy.

The two methods of recording pressures thus provide data for an interesting comparison and, if we bear in mind the different circumstances in which the records are obtained, the results are substantially in agreement. It is particularly important to note that the main objection which has been made against the intra-uterine bag method—namely, that it provokes an abnormal activity of the uterine muscle—is proved to be without foundation, for similar, or even greater, contractions are found to occur when the uterus is not disturbed by a foreign body inserted into its cavity.

The Uterine Thrust on the Fœtus

It is now possible to make an estimate of the propulsive force transmitted to the fœtus by the intra-uterine pressure.

The part of the fœtal head which is thrust against the pelvic tissues during the second stage of labour, and dilates or canalises these structures, is limited first by the sub-occipito-bregmatic plane, and later by the sub-occipito-frontal plane. For the present purpose it will be sufficient to regard this area as being circular in outline and having a diameter of 4 in. (10 cm.). A simple calculation may then be made.

Diameter of fœtal head exposed to pressure	= 10 cm.
Area of fœtal head exposed to pressure	$= \left(\frac{10}{2}\right)^2 \times 3.14$ (area = πR^2)
	or 78.5 sq. cm.
Each sq. cm. supports a pressure equivalent to 60 mm. mercury (average).	
1 c.cm. mercury weighs	13.6 g.
∴.6 c.cm. ,, ,,	$13.6 \times 6 = 81.6$ g.
Weight supported by head =	81.6×78.5 g.
	= 6406 g., or 14 lb. (approx.).

If to this figure is added the extra pressure caused by the bearing-down efforts of the mother (equivalent on the average to 45 mm. mercury), a similar reckoning will show that the total pressure acting on the fœtal head is the equivalent of approximately 24½ lb. Similarly, if the pressures registered in exceptional cases are taken into account, as, for example, those seen after injection of pituitary extract, the total thrust exerted on the fœtal head is found to equal the weight of 32 lb.

Comparison with Other Methods

It is interesting to compare these figures with the estimation of uterine force obtained by other means. Matthews Duncan, to whom reference has

already been made, determined the pressure required to rupture foetal membranes in 100 cases. From this he deduced that the uterine contractions transmitted, on the average, a propulsive force to the foetal head of not less than 16 lb. The highest figure he obtained in this series was 37.58 lb.†

There is still another means of estimating the power exerted by the parturient uterus. This is the simple procedure of measuring the pull required to effect delivery of the foetal head by the obstetric forceps. The method is more direct, but for obvious reasons less accurate than those already described. Matthews Duncan⁵ states that a pull not exceeding 80 lb. may be required. Wylie⁶ in a recent publication gives tables of figures showing the traction required under different conditions. He states that 35 lb. is an average figure (for primigravidæ), but that his most difficult case required a pull equivalent to the weight of 74.8 lb. It must be added that Wylie measured the traction on the obstetric forceps at a time when the uterus was also contracting, and, although the uterine powers were probably considerably modified by anæsthesia, this complicating factor makes it impossible to use his figures as more than a rough estimate for comparison with those already discussed. It will be seen, however, if we accept Wylie's figures, that the force exerted during an instrumental extraction is, on the average, at least one and a half times that which is estimated to be transmitted to the foetus by the expulsive powers of normal labour. During a difficult extraction the force employed may be more than twice that which is estimated to be transmitted to the foetal head by the maximum uterine and abdominal pressures of spontaneous delivery.

THE TOTAL THRUST TRANSMITTED TO THE FŒTUS: SUMMARY OF ESTIMATIONS BY DIFFERENT METHODS

By Intra-uterine Bag Method

(a) Resting tension plus uterine contractions (average) ..	14
(b) Resting tension plus uterine contractions plus secondary expulsive powers (average) ..	24½
(c) As in (b) but after pituitary extract injection ..	32

By Fatal Cord Method

Resting tension plus uterine contractions	23½
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By Bursting Strain of Foetal Membranes †

Average measurement	16
Greatest measurement	37.58

By Traction on Obstetric Forceps

Average traction (for primigravidæ)	35
Greatest traction	74.8

Conclusions

1. Various methods are described by which the intra-uterine pressure during labour may be measured.
2. A new method of measuring intra-uterine tension and of recording uterine activity without use of intra-uterine apparatus is presented.
3. The intra-uterine resting tension is equivalent to a pressure of about 15 mm. mercury.
4. First and second stage uterine contractions cause a pressure equivalent, on the average, to 60 mm. mercury.
5. Contractions of nearly equal magnitude can be recorded before the onset of true labour pains.
6. During the second stage of labour the bearing-down efforts of the patient bring an extra pressure of about 45 mm. mercury to bear on the foetus.

† Matthews Duncan assumed that the area of head in contact with the pelvic tissues measured 4½ in. in diameter; on the same basis my own figure would read 18 lb., 32 lb., and 41 lb. instead of 14 lb., 24½ lb., and 32 lb.

7. From these pressures the total thrust transmitted to the foetus during parturition can be estimated.

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WHAT IS SCARLET FEVER FOR THE CLINICIAN?

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IN 1899 "The Infectious Diseases (Notification) Act" became law throughout England and Wales, and included in the schedule of compulsorily notifiable diseases is the disease "Scarlet Fever." The penalty for failure to notify a case of this disease is 40s.

Upon the clinician in charge of a case rests the responsibility for diagnosis and notification, and it is pertinent therefore to review a situation in which he is placed not once but many times each year.

Reference to any text-book of medicine will show that the disease "Scarlet Fever" is defined in such terms as these: "An acute infectious disease due to a streptococcus characterised by inflammation of the fauces and a punctate erythematous rash followed by desquamation, and associated with a special liability to nephritis and otitis media." However much an individual clinician may recast or amplify these terms, it is impossible to omit "the punctate erythematous rash" which is the "scarlet" feature of the fever, and of diagnostic and therefore of notifiable significance. Every clinician after a few years of practical experience must ask himself certain questions:—

1. If the above definition in truth describes accurately the picture presented by a relatively small group of patients suffering from streptococcal infections, has it any merit other than its "classical attribute"?

2. If the notification of "Scarlet Fever" is confined to cases of the "classical" type, would it not be as rational to confine the notification of meningococcal fever to those cases which are "spotted"?

3. If the purpose of notification is to identify and segregate those liable to disseminate an epidemic disease, is the incidental and relatively unimportant development of a punctate erythema to be the only criterion?

4. Is it of any value to retain the name "Scarlet Fever" in the schedule of notifiable diseases, from the clinical or epidemiological point of view?

This is the problem, and before considering the clinical evidence it will be valuable rapidly to review the historical, bacteriological, and clinical aspects.

HISTORY AND EPIDEMIOLOGY

Rolleston, among many others, has remarked that "Scarlet Fever was very mild a century ago, fifty years ago it was extremely malignant, and now again it is a mild infection, although its prevalence cannot be shown to have diminished."¹ If this is true and "Scarlet Fever" was and is a specific disease, the alteration in its clinical character is due to an alteration in the virulence or prevalence of the specific causal organism or the constitution and composition of the population affected.

Bacteriology lends no support to the view that the specific causal organism has altered its character; indeed there is no specific organism, although there are erythrogenic streptococci of many types.

Epidemiological research has shown that the spread of disease is a function of the environment, and changes in social, sanitary, economic, industrial, and domestic conditions may have an important effect on the population, influencing the prevalence and spread of infection.

Absolute and statistical proof or disproof of the statement that "Scarlet Fever" has changed its clinical characteristics is impossible because of the indefinite name, and the entire absence of bacteriological data over the period covered.

The strongest inference that can justly be drawn from the records is that the *erythematous* feature has varied in epidemics of different malignancy.

The "scarlet" feature was giving trouble some forty years ago when "Scarlet Fever" was generally a severe disease, as is shown by the question raised by Dr. Clement Dukes, "Is there a Fourth Disease"? The Fourth Disease (Duke's disease) was in time succeeded by a fifth disease, Erythema Infectiosum, and eventually by a sixth disease, Exanthema Subitum.²

BACTERIOLOGY

In 1923 the Dicks isolated a strain of *Streptococcus hæmolyticus* which produced typical cases of "Scarlet Fever" in the susceptible, and demonstrated that after an attack a Dick-positive patient became Dick negative. The hope that the mysteries of the origin, infectivity, and clinical features of the disease had been removed proved false when further work revealed 27-30 strains of this streptococcus, *hæmolytic* but not necessarily associated with an erythema. There appear to be instances of the association of *non-hæmolytic* streptococci with a typical erythema and the clinical features and sequelæ of "Scarlet Fever."

The Schulz-Charlton reaction, at first regarded as "specific," is now known to be specific only in the identification of an erythema as due to a strain of streptococcus identical with the strain employed in the production of the antitoxic serum used in the test. This reaction regarded by some clinicians as of value in both prognosis and therapy finds this application only in approximately 50 per cent. of cases diagnosed as "Scarlet Fever" of the "classical" type.

The most that bacteriology can offer may be summarised as follows:—

1. Many strains of streptococci produce an exotoxin containing, among other noxious properties, an erythrogenic factor, this factor being most characteristic of the highly toxigenic hemolytic strains, which are associated with the more virulent infections of the throat, skin, connective tissues, and uterus.

2. The development of an erythema depends not solely upon the erythrogenic factor but also upon the susceptibility of the infected individual to it.

Bacteriology has rendered a signal service to clinical medicine by proving that all cases of "Scarlet Fever" (in the classical sense) are due to a streptococcus, most frequently of the hæmolytic type.

Bacteriology confirms clinical experience in demonstrating that the "Scarlet" feature is no more than a partially specialised reaction, depending for its development upon two factors, the bacterial strain and the susceptibility of the patient.

"Scarlet Fever," though essentially bacterial in origin, flouts all the postulates of Koch and is barely

able to support the dignity of a syndrome, yet it is a notifiable disease in an age in which the identification and classification of diseases is a striking feature of the progress of medical thought.

CLINICAL MEDICINE

It is the clinician who has to face this grave and difficult problem with its many absurdities, when he has to treat not only his patients but also their neighbours as contacts.

In the interests of medical practice and public policy a reconsideration of the whole position is long over-due.

In one sense the position is clear: when the clinician notifies an identified erythema, and segregates the patient under suitable conditions, his legal responsibility is discharged, the public conscience is satisfied, quarantine is observed by all contacts, and the erythematous patient is tended with all the care and devotion that the disasters of previous experience have shown to be necessary. The public is prepared for complications by the reputation of the disease. But what of the patient who develops no erythema? Many clinicians experienced in the subject have noted that in epidemics of streptococcal infection—

1. A hæmolytic streptococcus has been demonstrated in many cases which could not be called "Scarlet Fever."

2. The liability to serious complications appears to be slightly greater *without an erythema*. If there is a rash a *negative* Schultz-Charlton reaction is an unfavourable sign.

3. In household infections of streptococcal sore-throat, an erythema develops in only a few cases.

4. The infectivity is identical *with or without an erythema*.³

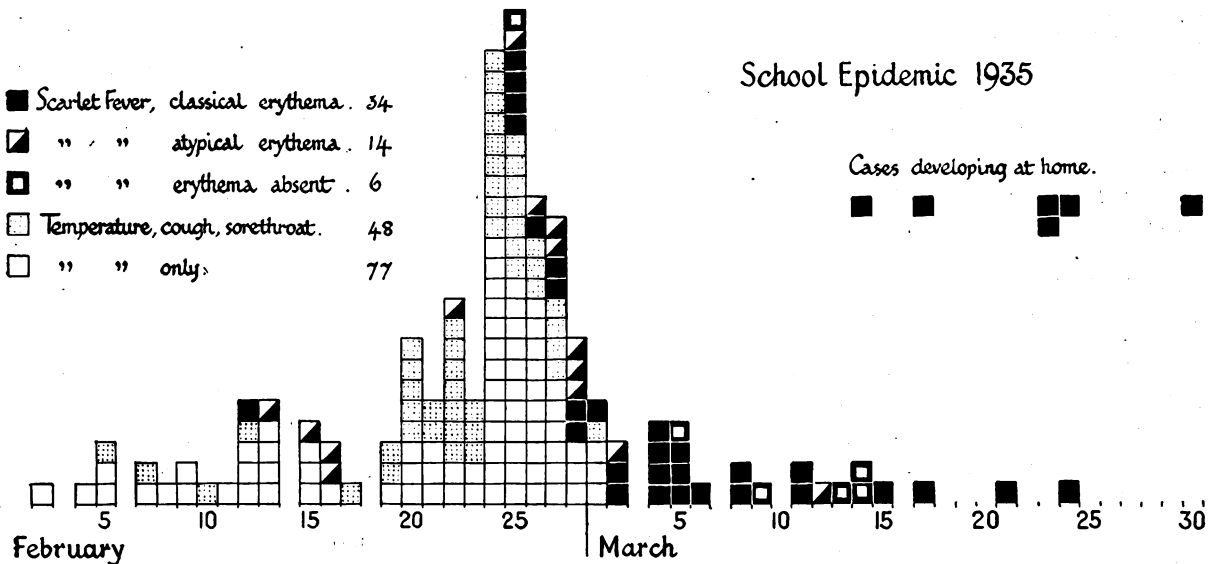
In other words the erythema is a favourable sign, and yet notification and strict isolation is reserved for those cases alone. "It is well known that, in so far as controlling an epidemic is concerned, the rigid hospitalisation of every case of 'Scarlet Fever' has completely failed."

The position which the later clinical evidence will illustrate is that streptococci pathogenic to man, with a strong invasive tendency, give rise to a wide complex of pathological states, which have a close consequential relationship one with another.

There may be a toxæmia, from the absorption of exotoxin from the organisms in a primary focus, or there may be dissemination of the actual organisms from such a focus with secondary lodgment in distant organs, by a transitory bacteriæmia, or lastly the organisms may enter and multiply in the blood stream giving rise to septicæmia.

From a primary focus there may develop one or all of these sequelæ, the path of dissemination being by the lymph stream, or by the blood stream, or by both. Each of these states may develop *with or without an Erythema* even when due to a streptococcus of the Hæmolytic type. There are cases in which an Erythema develops apparently in association with a Non-hæmolytic Streptococcus, and the clinician is tempted to wonder whether there is not a bacterial no-man's land in which there are to be found strains of streptococci possessing the Erythrogenic but not necessarily the Hæmolytic factor.

If it can be shown that streptococci of various types can, *with or without an Erythema*, produce pathological lesions strictly comparable from the clinical and epidemiological standpoints the case for the abolition of "Scarlet Fever" from the clinician's vocabulary is proved.



The cases are drawn from personal, hospital, or private practice, and are not in themselves dramatic or unusual. From medical literature the evidence could be amplified a hundredfold.

TERMS USED IN CLINICAL REPORTS

1. The erythema or rash—the “classical” fine punctate erythema, which is supposedly characteristic of “Scarlet Fever,” is implied where this term is used without qualification.
2. Desquamation and the appearance of the tongue are (usually) noted.
3. In most instances differentiation of the streptococcus involved has been carried no further than the distinction between “hæmolytic” and “non-hæmolytic.”

CASES OF TONSILLITIS OR PHARYNGITIS WITH AND WITHOUT ERYTHEMA

1. Mrs. J-J, Miss M. J-J, and Miss E. J-J stayed with friends suffering from “sore-throats.” Sept. 11th, 1934.—Miss M. J-J developed an attack of acute tonsillitis with no rash; no sequelæ. The family returned home on the 16th. 19th.—Mrs. J-J (scarlet fever as a child) developed a very severe and acute tonsillitis; no rash and no sequelæ. 26th.—Miss E. J-J developed an acute tonsillitis and on the 27th a rash, later a typical strawberry tongue and desquamation; no further sequelæ.

Comments.—Swabs from all throats had hæmolytic streptococci. Miss M. J-J (the original case) still showed hæmolytic streptococci on Oct. 15th. By law, only Miss E. J-J was notified. Similar family groups are met with again and again.

2. A small epidemic in a school of 95 boys (Table I.).

TABLE I

Admissions to sanatorium.	
March 5th, 6th, 7th, 1933	6 boys with acute pharyngitis and acutely inflamed glands of neck.
March 14th	1 boy with the same clinical features.
March 28th, 31st	5 boys
April 4th	2 boys

Comments.—Each of the 14 boys had a tonsillectomy before entering the school; no one with intact tonsils was involved. The clinical picture presented by each was identical, the onset being acute with high fever and severe toxæmia. Five boys were discharged 10–12 days after admission; nine boys were ill for 21–35 days. Hæmolytic streptococci were demonstrated in the swabs taken from one member of each group.

Boy No. 1 was a case of acute and severe illness with high remittent fever for five weeks, a rigor with a temperature of 104° in the fourth week (presumably a

transitory bacteriæmic shower) and acutely inflamed lymphatic glands. The glands eventually subsided without suppuration.

Boy No. 12, admitted with acute pharyngitis and lymphadenitis, on the second day developed an acute otitis media (left) with instantaneous perforation; on the fourth day a general rash with subsequent desquamation. Operation later for left mastoiditis.

By law, only No. 12 was notified.

3. A small epidemic in a school of 75 boys (Table II.).

TABLE II

Admissions to sanatorium.		Throat swab.
1. Ev.	June 1st. Acute tons.; vomit ..	Not done.
2. D.	3rd. Ditto; erythema on second day.	Hæm. strept.
3. B.	8th. Acute tons. ..	Non-hæm. strept.
4. C.	14th. Acute gran. pharyngitis; no rash; no sequelæ.	Hæm. strept.
5. H.	29th. Acute tons.; vomit	Non-hæm. strept.
6. V.	30th. Ditto.	
7. R.	1st. July. Ditto; erythema on second day.	
8. Ed.	9th. Acute tons. ..	

Tons.=tonsillitis. Hæm. strept.=hæmolytic streptococcus.

Other admissions to sanatorium in the above period consisted of minor sepsis and trauma.

The swabs were all taken personally on the first day of admission to the sanatorium (temp. 102–103°) and were examined for K.L.B., hæmolytic, and non-hæmolytic streptococci.

Boy No. 2 produced a typical erythema, tongue and subsequent desquamation without sequelæ, the infection being due to a hæmolytic streptococcus.

Boy No. 7 produced a typical erythema well developed over the back, lower abdomen, groins, and thighs—“bathing drawers” type—but lasting only 24 hours, the infection being due to a non-hæmolytic streptococcus. In all cases the attacks were mild and recovery rapid. No. 2 and No. 7 showed no feature other than the erythema to distinguish them from the remainder. The urine in no case showed any albuminuria during the third week, after the initial tonsillitis.

4. An epidemic in a school of 371 boys.—The material for this report has been kindly submitted to the writer by a colleague who, with the M.O.H., supervised the epidemic. The school is residential, and there are 338 boarders and 33 day boys. The boarders live in “houses” and have a common dining-room and the boys also mix in the house dormitories and day-rooms. The history of the epidemic is shown in the chart.

In the first half of February there was an outbreak of "influenza" with sore-throats, temperatures, coughs, and profuse nasal catarrh.

Difficulty was experienced in controlling the epidemic for the following reasons:—

(a) The cases were not confined to any particular house, dormitory, classroom, or dayroom, and as the boys mixed in all four places, practically the whole school had been exposed to infection. Isolation and detection of contacts was impossible.

(b) The original cases were missed because of an epidemic of sore-throats, cough, and coryza, possibly influenzal, and the rashes might have been the result of influenza.

The Dick test was unreliable in this epidemic of type V. (Franklin) hæmolytic streptococci; and too much reliance was placed on a negative result in the presence of an atypical symptom.

(c) The catarrhal symptoms in the "influenzal" epidemic would tend to increase the danger from normal carriers.

The Schultz-Charlton reaction was reliable in the presence of a good rash, but the reaction was sometimes delayed for 48 hours.

The endemic cases of scarlet fever in the town at this time were due to type I. hæmolytic streptococci (Table III.).

The typing of the streptococci was carried out by Dr. F. Griffith of the Ministry of Health.

TABLE III

Cases Analysed According to Type of Erythema

Remarks.	Erythema.			
	"Class-ical."	Atypical and trans-sient.	"Sur-gical."	Absent.
55 cases	34	14	1	6
Streptococcus type V. ..	19	5	—	4
type XI. ..	—	—	—	1
Untyped	15	9	1	1
Complications	18	3	1	3

Analysis of Complications

Total=25 (approximately 1 in 2)

	"Class-ical."	Atypical and trans-sient.	"Sur-gical."	Absent.
Rhinitis	5	—	—	—
Adenitis	2	—	—	1
Otitis media (operation) ..	—	—	—	2
Mastoiditis (operation) ..	3	—	—	—
Quinsy	1	—	—	—
Carditis	—	1	1	—
Carditis and arthritis ..	—	—	—	—
Carditis and rheumatism ..	—	1 (D)	—	—
Adenitis and rheumatism ..	3 (1*)	—	—	—
Rheumatism	2	—	—	—
Sinusitis; cerebral abscess ..	1	—	—	—
? Mesenteric thrombosis ..	1 (D)	—	—	—
Total	18	3	1	3
Streptococcus type V. ..	16	3	—	2
type XI. ..	—	—	—	1
Untyped	2	—	1	—

* Developed a late albuminuria. D=death.

Comments.—In the six cases "erythema absent" the diagnosis was established as follows:—

- 1 case (No. 2); tonsillitis, Feb. 3rd, 1935; desquamation, March 6th, 1935.
- 1 case (No. 45); otitis media-paracentesis type V. streptococcus.
- 1 case (No. 39); temperature; headache; type V. streptococcus.
- 1 case (No. 44); tonsillitis; type V. streptococcus.
- 2 cases (Nos. 32, 43); mastoiditis; operation; type V. streptococcus.

These six cases without erythema almost certainly do not represent the true total in this group when it is recognised (see diagram) that there were 48 cases of "sore-throat and temperature" and 77 cases of "influenza."

In the next term there were nine further cases of scarlet fever, the streptococcus type III. being demonstrated in two cases and an untyped hæmolytic streptococcus in one case (Table IV.).

TABLE IV

Remarks.	Erythema.			
	"Class-ical."	Atypical and trans-sient.	"Sur-gical."	Absent.
9 cases	6	2	1	—
Streptococcus type III. ..	1	1	—	—
hæmolytic ..	1	—	—	—
Untyped	4	1	1	—
Complications	1	2	—	—

Analysis of Complications

Total=3 (1 in 3)

Measles; pneumonia ..	1 (D)	—	—	—
Vincent's angina	—	1	—	—
Measles; mastoiditis; bilateral operation ..	—	1	—	—

D=death.

Comments.—1. "Surgical" mosquito bite June 18th, 1935; sore-throat; rash June 21st.

2. Atypical cases.

1 case (No. 59); Vincent's angina June 24th; faint "bathing drawers" rash June 28th.

Subsequent desquamation.

1 case (No. 62); measles, atypical rash ? mixed infection; double mastoid operation; type III. streptococcus.

3. 1 case complicated by measles, pneumonia, and death, showed type III. streptococcus.

The conclusions which can be drawn from these epidemic groups are as follows:—

- 1. The appearance of an erythema was fortuitous and without special clinical importance.
- 2. It was significant only in that it was evidence that an erythrocytic streptococcus was involved.
- 3. The early cases of each group which from the epidemiological point of view should have been isolated had no erythema. To notify only the cases with a rash gave a false impression of the extent or virulence of each epidemic.

Bacteriological research is proving that certain strains of streptococci cause epidemics in which severe complications are pronounced *with or without an erythema*, and early recognition of prevalence of these strains in the community would be valuable. To the clinician in charge of a school or family this information would be of special value. Precautionary measures can be exercised such as isolation and appropriate prophylaxis against dissemination can be adopted. The serious or fatal complications of streptococcal epidemics in the community in general and in schools in particular present a problem as urgent and important as that of diphtheria or any other epidemic disease.

SEPTIC SCARLET FEVER AND SURGICAL SCARLET FEVER

The classical case from which the Dicks isolated and proved the infectivity of the scarlatinal streptococcus may well be quoted:—

The patient was a nurse who was attending an ordinary case of scarlet fever. For two days before the onset of her own attack she had a sore finger. The pus from which the Dick cultures were obtained was taken from the finger on the second day of her scarlatinal attack. It is now a matter of history that it was by swabbing the throats of volunteers with these cultures that the Dicks produced two typical cases of scarlet fever.

Another case referred to by Dr. C. R. Box 4:—

A superintendent medical officer at the London Fever Hospital, when dressing a suppurating gland in the neck of a scarlet fever patient, infected an abrasion on his finger. The axillary glands rapidly swelled up accompanied by high fever and a rapid pulse. A hæmolytic streptococcus was grown from the blood and in a few days he was dead from streptococcal septicæmia. *In this case no scarlatinal rash was seen*, but there was no doubt as to the source of the infection.

An Erythema is unusual in septicæmia due to a Hæmolytic Streptococcus. (Compare Case 2 in next clinical group, where the portal of entry was in the tonsils.)

G. B., aged 30, engineer. July 8th, 1935.—Small abrasion right thumb, dressed with iodine; scabbed over. 12th.—Scab knocked off; iodine applied; on the same day he dropped a heavy weight on toes of right foot. 14th.—Vivid lines of acute lymphangitis covered with vesicles extended from thumb abrasion to axillary lymph glands which were acutely inflamed and tender. 15th.—Vivid lines of acute lymphangitis covered with vesicles extended from injured toe to right inguinal group of glands which were acutely inflamed. 16th.—*Typical general scarlatiniform rash*; throat injected; a superficial dermatitis of the foot which developed from the infected toe clefts took some three weeks to clear up.

Comment.—The history suggests that the infection from the original wound on the thumb was inoculated while dressing the foot. The whole illness was strikingly mild, the temperature on one day reaching only 100° F.; apart from the dermatitis of the foot convalescence was uneventful.

CASES OF TONSILLITIS WITH A BACTERIEMIA OR SEPTICÆMIA WITH AND WITHOUT ERYTHEMA

1. Mrs. D. D., aged 22. July 3rd, 1935.—Delivered by midwife; small perineal tear; two stitches. 4th.—Rash noted by patient; two or three attacks of shivering. 5th.—Admitted to hospital: typical scarlatiniform rash, acute tonsillitis, pharyngitis, and local adenitis (confirmed by M.O.H.), labia tender and oedematous; uterus involuting normally; lochia normal and copious. 6th.—Antiscarlatinal serum 40 c.cm. 7th.—Antiscarlatinal serum 40 c.cm. 8th.—Typical strawberry tongue, rash fading, fauces injected; swab from fauces—*non-hæmolytic streptococcus*. 11th.—Blood culture positive, *hæmolytic streptococcus*. 12th.—Human serum intravenously from 80 c.cm. of whole blood. 14th.—Human serum intravenously from 50 c.cm. of whole blood. 17th.—Blood culture negative; swinging pyrexia. 23rd.—Fluctuant swelling over sacrum and trochanter (left) freely incised; nil found; branny desquamation. 26th.—Pyrexia continued; blood culture negative. August 6th.—Swelling over sacrum again incised; fluid pus containing streptococcus (untyped); fever subsided. Convalescence uneventful.

Comment.—Two possible portals of infection—fauces associated with a non-hæmolytic streptococcus; perineal tear associated with hæmolytic streptococcus. Classical picture of "Scarlet Fever," associated with a bacteriæmia due to hæmolytic streptococcus, metastatic abscess, and recovery.

2. V. S., aged 42. Nov. 9th, 1932.—Sore-throat. 11th.—Acute tonsillitis; T. 103° F. 14th.—Fauces clear; two tender glands in posterior triangle of neck (left). 15th.—Fauces clear; acute rhinitis; glands less tender; rigor; T. 104° F. Blood culture: hæmolytic streptococcus in all tubes in 12 hours. 16th–20th. Daily. Antiscarlatinal serum intravenous, 50 c.cm. Antiscarlatinal serum intramuscular, 15 c.cm. 21st.—Death. There was no rash.

Comment.—Acute tonsillitis, lymphadenitis, septicæmia due to hæmolytic streptococcus without a rash followed by death.

3. S. F., aged 12. 23 out of 75 boys were admitted to the school sanatorium between April 29th and July 25th with tonsillitis, all with mild attacks and without erythema

or complications. The streptococcus involved was not typed.

July 1st–5th, 1934.—Acute pharyngitis (tonsils had been removed). 5th–13th.—Pharynx clear; acute adenitis. 14th.—Consolidation left apex, small area; acute arthritis, left hip aspirated; (report—polymorphs and endothelials). Culture negative. Blood culture positive—*non-hæmolytic streptococcus*. The boy was very acutely ill and in the course of a few hours' sleep developed a sacral bedsores. 15th.—Effusions into right knee, wrist, and shoulder and left hip. 16th.—Effusions into right and left knees and left hip, right and left ankles, right shoulder and wrist. 17th.—Left apex clear; effusions subsiding. 20th.—Effusion into interphalangeal joints, right forefinger; a soft apical systolic murmur became evident about this time, and subsequently signs of a definite myocarditis, which involved a prolonged convalescence.

Comment.—Acute tonsillitis, lymphadenitis, bacteriæmia due to *non-hæmolytic streptococcus*, multiple arthritis, carditis, without a rash. The case is quoted to emphasise the similarity with a clinical picture not uncommon in "Scarlet Fever" associated with arthritis and carditis.

DISCUSSION AND SUMMARY

The illustrative clinical cases quoted above prove that:—

1. An erythema is inconstant in infections due to a hæmolytic streptococcus.
2. It may be a feature of those due to a non-hæmolytic streptococcus.
3. Though it is more frequent in infections due to hæmolytic streptococci, it is a poor guide to the course, prognosis, or infectivity of the disease in a given patient.
4. Infections due to hæmolytic streptococci *with or without an erythema*, are generally highly toxic, highly infectious, and have a striking association with sequelæ of all kinds. *The appearance of an erythema is probably a favourable sign.*
5. An infection due to a non-hæmolytic streptococcus may have sequelæ in no way distinguishable from those due to a hæmolytic strain, whether there is an erythema or not.

If these statements and conclusions are sound it is pertinent to consider what alterations or modifications of clinical practice and teaching should be introduced.

Firstly, the executive and primary object of notification is to segregate those liable to spread an epidemic disease, and to effect this, suitable hospital accommodation is provided which must be used when the home conditions cannot ensure proper isolation.

It is admitted by every medical officer of health that strict hospitalisation in cases of streptococcal fever that develop a rash has completely failed to control epidemics, and this is supported by clinical evidence.

The notification of "Scarlet Fever" as at present practised serves no useful purpose; indeed, it is probably of disservice from the executive standpoint because it confines valuable hospital accommodation to a selected group. The accommodation could be better employed for cases of streptococcal infections selected on clinical grounds or for domestic reasons, rather than by an Erythema. A much higher standard of isolation is essential because the inmates are not all suffering from the *same disease*.

Secondly, the public is still prone to regard tonsillitis as a trivial complaint, and is still uninformed of the disasters which may follow the neglect of simple precautions; the profession has, in this respect, neglected its educational function.

Isolation of the patient in the home, the use of separate feeding utensils, and masking or gargling by the attendants, is generally neglected and should be enforced. To confine patients to bed for a minimum of 7–10 days, and to examine the urine in the

third week are two measures of obvious clinical value.

Thirdly, the use of a swab as a public health measure could, with value to the clinician, be used not only to identify the Klebs-Löffler bacillus but also the Hæmolytic or Non-hæmolytic Streptococci. To know the type of streptococcus present in a given case would be of real value to the clinician in charge.

Fourthly, an increasing number of experienced clinicians believe that it is of proved value to give so-called antiscarlatinal serum in the early therapy of infections due to Hæmolytic Streptococci to relieve symptoms and to prevent complications. The public health services should therefore provide the serum for use in hæmolytic infections on the same basis as it provides serum for the treatment of Diphtheria.

CONCLUSIONS

1. "Scarlet Fever" even if descriptive of a clinical entity has no claim to retention in the clinician's vocabulary of diseases.

The dermatological or more accurately the vascular manifestations of an infection due to a streptococcus or a meningococcus are in themselves of minor clinical importance.

2. The term "Spotted Fever" has been expunged from scientific medical nomenclature, and the time has come for "Scarlet Fever" to suffer a similar fate.

The retention of the term "Scarlet Fever" in the schedule of notifiable diseases is of no service to the patient, the public, or the profession.

The writer wishes to record his thanks to Dr. G. C. Williams, Dr. J. Frankland West, and Dr. A. D. Gardner for valuable assistance.

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INTRAVENOUS ANÆSTHESIA WITH PENTOTHAL SODIUM

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It is natural that there should be some hesitation about injecting into the circulation a drug which cannot afterwards be withdrawn, and therefore objection is sometimes taken to the intravenous use of barbiturates for anæsthesia. Against this, however, we have the fact that they are used in extreme dilution and katabolised extraordinarily rapidly, leaving no ill-effects behind them. In our opinion this makes them less obnoxious than ether, chloroform, or any form of inhalation anæsthetic except nitrous oxide-oxygen. The avoidance of a sense of suffocation and of almost all psychic shock, the remarkable freedom from vomiting, and the absence of delayed poisoning, together with the complete safety of intravenous anæsthetics in our hands in many thousands of cases, have encouraged us to continue this line of clinical research and extend it to the use of Pentothal, which we met in America

sixteen months ago and introduced into this country by the kindness of Messrs. Abbotts, while it was still in its experimental stage as "8064."

The barbiturates used for intravenous anæsthesia fall into two groups: heavy and light. The heavy, including Nembutal, Pernocton, Sodium Amytal and Di-dial, are slowly broken down and are found in excretions up to 72 hours after administration; accordingly we prefer to use them as narcotics and not as general anæsthetics. The light barbiturates, Evipan sodium, Eunarcon, and Pentothal sodium are broken down so fast that barely a trace can be found in excretions after 12 hours. For all practical purposes their effect has passed off in from 3 to 30 minutes, according to whether a minimal or normal dose has been used. Provided reasonable precautions are taken they appear to us to be quite safe for all minor operations, and as a means of induction or total anæsthesia for a very large proportion of major operations.

ADMINISTRATION

For minor operations—e.g., dental extractions, the opening of boils and whitlows, the removal of nails, and the setting of fractures—no preliminary medication is needed and only the minimum dose required to produce surgical anæsthesia should be used. Usually 3 c.cm. of evipan or pentothal are sufficient. For major operations on patients in an institution we use premedication with omnopon and scopolamine.

The intravenous anæsthetic may be administered in one of three ways:—

(a) *As a single dose.*—This is used for an operation which is likely to last from 10-20 minutes—e.g., cesophagoscopy, bronchoscopy, cystoscopy and cysto-diathermy, sigmoidoscopy, and dilatation and curettage.

(b) *Repeated doses.*—If the effect of the anæsthetic begins to pass off, a second or even third dose may be administered by the intravenous route.

(c) *By continuous intravenous infusion.*

Any operation which is found to take longer than was anticipated may have its anæsthetic supplemented either by a further intravenous dose as described above, or by an inhalation anæsthetic.

Pentothal sodium* is supplied in ampoules each containing 1.0 gramme, together with a separate ampoule containing 10 c.cm. of sterile distilled water. It is a yellow crystalline powder and when 1.0 g. is dissolved in 10 c.cm. of water it produces a gaseous solution which takes a moment or two to clear and is then ready for use. The gas given off during the mixing is of the H₂S type. It is important to see that there is no precipitate. We have now used it in more than 1000 cases, and may briefly describe its effects as follows.

EFFECTS

The *induction period* is as dramatic, smooth, and pleasant as with evipan. Most patients go to sleep without yawning, but occasionally they yawn as with evipan.

Respiration.—One of the most important points to note is that in using this drug for surgical anæsthesia the respirations become shallow, but their rate and rhythm remain unchanged. If the anæsthetic is injected too quickly, the respirations may

* Thio-barbiturate pentothal sodium has been known under the name of thio-barbiturate 8064. Messrs. Abbotts, of Chicago and Montreal, kindly allowed us an unlimited supply of this as well as a small quantity of the closely allied drug thio-barbiturate 8076. In view of the excellent results obtained by our friends, Dr. A. L. Tatum and Dr. R. M. Waters, both of Madison, Wisconsin, we decided to use it in this country, and this was done in collaboration with Dr. J. S. Lundy, of the Mayo Clinic.

become imperceptible, and it is therefore advisable to allow a double safety pause during the administration of this drug. When it is carefully injected the respiratory depression is not great, and in any case is rapidly overcome by healthy young adults. In older people the return to normal is delayed.

The *airway* is of vital importance, and an appropriate dental prop must be inserted before the anæsthetic is given. If the respiration becomes too depressed oxygen or CO₂ and oxygen may easily be administered via the Hewer's airway, which may with advantage be replaced by a Phillips's airway as soon as the patient is unconscious. Throughout the injection the angle of the jaw must, of course, be supported, with the head on one side or partially extended.

Colour.—Often the patient becomes slightly cyanotic, older patients more than younger. A well-maintained airway, with or without a little oxygen, soon restores the colour.

The *pulse* quickens as soon as the first two or three cubic centimetres have been given. It gradually loses some of its volume, but returns to normal within a few minutes. If strict attention be paid to the patient's colour, the pulse does not become weak.

The *pupil* first dilates, but soon becomes normal. The corneal and conjunctival reflexes are lost for the whole time that the drug is acting as a surgical anæsthetic. As soon as it starts to wear off, the reflexes return to normal.

No *tremors* have been seen except where the minor operation had been started before complete surgical anæsthesia had developed. In this case, tremors started and took two or three minutes to disappear.

Recovery.—Most patients recover a little more quickly than with evipan, and their minds are clearer. We have observed no case of post-operative restlessness and no cause for anxiety, provided the airway has been properly maintained. Varying degrees of post-anæsthetic drunkenness occur, but this passes off more quickly than after evipan.

Accidents.—If a small or greater part of this solution is injected into the subcutaneous tissues there will be a little local reaction. It is of course important that the syringe and needles are free from all spirit. If the drug is given too quickly there is a dangerous depression of the respiratory centre.

ADVANTAGES AND DISADVANTAGES

The only drug in use as an intravenous anæsthetic with which we can compare pentothal is evipan, and we have no small difficulty in comparing and contrasting these. The main differences which we have noticed are:—

1. Induction with pentothal is a little smoother.
2. Pentothal scarcely ever produces the twitching or jactitation which we have occasionally seen with evipan.
3. The fall in blood pressure is less noticeable than with evipan.
4. The main disadvantage of pentothal is that it is more depressant to the respiratory centre, and for this reason we always like to have a McKesson apparatus at hand to administer oxygen and carbon dioxide under pressure if required.
5. A few patients have complained of a sulphurous taste or smell for a short time after the administration of pentothal.

CONTRA-INDICATIONS

Liver.—These light barbiturates are metabolised in the liver very rapidly, and any gross hepatic disease or the presence of jaundice is a definite contra-indication.

Low blood pressure.—General feebleness of the patient and low blood pressure make it inadvisable to use doses liable to cause a definite fall in blood pressure.

Posture.—Owing to the fall in blood pressure with all intravenous barbiturates, the recumbent posture is the safest for the administration of these anæsthetics. Several untoward effects have been encountered in the dental chair even with healthy patients.

Space.—Lack of available space applies only to institutions where a large number of patients are to be dealt with and where enough room is not available to allow all of them to recover sufficiently to return home.

Other barbiturates.—As a general rule it is not advisable to give any barbiturate intravenously after other barbiturates have been given as premedication.

ANTIDOTES

The antidotes to pentothal do not differ from those of any other form of general anæsthetic, nor are they more often needed. Coramine is by far the most reliable drug for collapse and it should be used liberally. Five cubic centimetres are the average dose, and 10 c.cm. may be given for severe collapse. It may be given subcutaneously or intramuscularly, or, in a case of emergency, intravenously. It has a stimulating effect on the heart and respirations. Alpha-lobeline is a direct respiratory stimulant and is used in doses of gr. 3/20, or 3/10, either subcutaneously or, in urgent cases, intravenously. Another direct respiratory stimulant is carbon dioxide. It is given, of course, by mouth, preferably under pressure in the proportion of 5 or 7½ per cent. CO₂ in oxygen. A cylinder of this mixture should be in every operation-room and in every recovery-room.

Though it has proved possible to kill animals with pentothal no pathological changes could be discovered in their organs post mortem apart from signs of respiratory failure.

AFTER-EFFECTS

In our series of over 1000 cases there have been no deaths following the use of pentothal sodium, nor does any pathological process appear to have been aggravated. No patient who has had pentothal alone has vomited after an operation. Vomiting has occurred in a very small proportion of those cases that have had premedication in addition to pentothal, but the proportion was no greater than after taking an opiate alone, and was much less than after an ordinary inhalation anæsthetic.

We regard pentothal sodium as a worthy addition to our list of safe and satisfactory intravenous anæsthetics.

PRINCESS ELIZABETH OF YORK HOSPITAL, SHADWELL.—Mr. Meyerstein has promised to pay £5000 for the 25 acres of hillside at Banstead which face the site where the new hospital is to be built. This will keep the prospect open for ever. Mr. Meyerstein is also giving £10,000 towards the cost of the new building.

NEW HOSPITAL FOR SCARBOROUGH.—When the new hospital is opened at Scarborough, additional maintenance costs will have to be met and the authorities have decided to launch a contributory scheme under the British Hospitals Contributory Scheme Association. The new building will have 140 beds, the present hospital has 70, and the annual expenditure it is estimated will be between £12,000 and £15,000. Under the scheme it is proposed that the weekly contribution shall be 3*d.* for adults and 2*d.* for those over sixty and under twenty-one.

TREATMENT OF PSYCHOSES BY PROLONGED NARCOSIS

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The treatment of psychoses by prolonged narcosis has been popular on the continent for some years and has proved so effective in manic-depressive states that a diagnosis of mania or melancholia is considered doubtful if no improvement follows prolonged narcosis therapy.

After careful physical investigation and the administration of an enema, the patient is put to bed in a single room and every effort made to ensure absolute quiet. The most favoured drug is Somnifaine given in 2 c.cm. doses by intramuscular injection in sufficient quantity to ensure continuous sleep for 10-12 days, feeding with fluids being carried out before each injection and at intervals when possible. Poisonous symptoms are unfortunately very common and have prevented the more general adoption of the treatment. Thus early collapse, or a condition similar to "veronal pneumonia," or great difficulty in swallowing combined with oedema of the throat and an excessive secretion of mucus, may occur, and other less serious or less common symptoms are muscular incoördination, irregular and sometimes high pyrexia, a fall of blood pressure, hyperidrosis, various rashes, albuminuria with or without casts, oliguria, anuria, and epileptiform convulsions. Added to these is a liability to contract pulmonary infections.

Investigations at the Cardiff City Mental Hospital by Quastel and Wheatley¹ and Quastel and Ström-Olsen² having shown that narcosis interfered with the carbohydrate metabolism of brain cells, it was suggested that a similar action on the heart, liver, and other organs might be responsible for some of the poisonous symptoms of prolonged narcosis. Ström-Olsen³ found that 70 per cent. of patients undergoing this treatment showed acetone in the urine, while glucose tolerance was lowered and glycosuria common. He consequently treated his patients by giving glucose and 10 units of insulin with each 2 c.cm. of somnifaine and reported that extreme drowsiness, cyanosis, coldness of the extremities, and vomiting remained in abeyance; though pyrexia, albuminuria, oliguria, and leucocytosis still occurred, the dangers of prolonged narcosis were in general greatly reduced. Ström-Olsen includes a comprehensive review which it is unnecessary to repeat and says that the average death-rate had been 4 per cent. without insulin, whereas his series of 46 treatments was without a death. Contra-indications are emaciation, cardiac weakness, renal affections, and pulmonary diseases, while tachycardia, a severe fall in blood pressure, high pyrexia, persistent vomiting, and a dusky complexion with shallow breathing and extreme drowsiness are indications for the cessation of treatment.

In a later communication Ström-Olsen and McCowan⁴ report that of 49 schizophrenics 8.1 per cent. recovered and 38.7 per cent. improved; of 45 manic-depressives, 37.7 per cent. recovered and 29 per cent. improved; and of 13 psychoneurotics 61.5 per cent. recovered and 15.4 per cent. improved.

The present report deals with 60 treatments by prolonged narcosis given to 56 female patients between January, 1934, and June, 1935, 45 treatments being carried out with insulin and glucose as well as somni-

faine, and 15 with somnifaine and glucose only. Four patients had two courses of treatment, one each with and without insulin, two being given insulin during the first course and two during the second. There were 3 deaths in the series, 2 while receiving insulin—a death-rate of 5 per cent. Before discussing the toxic effects further, a brief summary of the results will be given.

RESULTS OF TREATMENT: DOSAGE

Psychoneuroses.—Anxiety states, 8 patients. Of these, 4 showed no change; 1 showed slight improvement, but soon relapsed; 1 showed slight improvement which was maintained; and 2 showed marked improvement, which was maintained. Exhaustion states, 2 patients. One showed no change and the other slight improvement which was maintained. One case of hysteria was unaltered by treatment.

Mania (11 patients).—One chronic mania remained unchanged. Of the acute cases 1 died; 3 others all showed immediate benefit but all relapsed. Of these, 2 relapsed quickly and have remained hypomanic for over a year, while the other remained well for a few months, after which an acute relapse was treated by somnifaine narcosis with a very excellent result; the patient has been perfectly well for over a year. The remaining 6 were acute manic types with superadded confusion. Two showed no response, 2 improved but relapsed, and 2 improved in a very striking manner and were discharged from hospital in one and two months respectively.

Melancholia (11 patients).—Of 3 cases of the involuntional type, none showed any response to treatment. One was discharged later. Of the others one died and one showed no change. Three improved but relapsed, and 3 improved considerably and were later discharged; but the duration in hospital was not strikingly reduced.

Schizophrenia (19 patients).—In 8 cases there was no improvement, and 2 of these had a further course, again with no benefit. Three patients improved and were discharged from hospital but later returned. One of these returns had a second course without benefit. Three improved, were discharged, and remain well. One of these was a voluntary patient aged 26, who had been a certified patient at 22 and had been in hospital for two years, afterwards remaining well for nearly two years. When seen at an out-patient clinic she had been away from work for two months with apathy and odd conduct. She was given a 10-day treatment and returned to work a week later.

The last of this group was a chronic patient subject to manic episodes of great intensity and duration. One of these acute phases was treated with marked success, and she was out on parole a few days after the treatment finished.

Paraphrenia (3 patients).—Two menopausal paranoid women, aged 44 and 47, whose prognosis was considered unfavourable, improved in a very remarkable manner. One had been completely stationary for nearly three months but after treatment was discharged in less than a month, while the total duration in hospital of the other was less than two months. A third case, aged 55, improved but soon relapsed.

The last case of this series was a young but chronic epileptic, who had been in a state of continued excitement for two months. A severe toxicosis resulted in death.

Altogether, in 60 treatments, definite improvement was shown 33 times, and in 16 cases it was maintained at least for a considerable period. The average duration of treatment and dosage was as follows:—

	Days.	Dosage per day.
Under 45 with insulin	.. 9.3	.... 5.7 c.cm.
.. 45 without ..	.. 10.5	.... 5.3 ..
Over 45 with insulin	.. 8.0	.... 4.2 ..
.. 45 without ..	.. 6.9	.... 6.3 ..

The average dosage is similar to that reported by Ström-Olsen. If cases whose treatment was abandoned after two or three days were excluded, the duration would read appreciably longer.

20 c.cm. of 30 per cent. alcohol hourly for four doses, as recommended by Carrière, Huriez, and Willoguet,⁸ and this produced profuse sweating and a stronger pulse, but failed to delay the end. In the first case recovery took place without lumbar or cisternal puncture, and cisternal puncture was performed once in a fatal case and once in a case that recovered. In all these 6 cases consciousness was restored, but the toxic process in the liver, kidneys, or heart was too advanced for treatment to be successful in 2 of them.

Epileptiform convulsions.—One patient had a convulsive seizure 4 days after the termination of a 12-day course. The narcosis was without incident, and there was no personal or family history of fits.

THE DEATHS

The first death occurred in a case of mania.

The patient, aged 32, developed a temperature of 102° F., with albumin, abundant casts and sugar in the urine on the eleventh day. Treatment was stopped and the patient soon began screaming ceaselessly. Rectal paraldehyde and numerous stimulant drugs were tried but profound exhaustion set in and the patient died on the 13th day with a terminal hyperpyrexia of 107°. Sections of the heart, liver, and kidneys were examined by Dr. J. Gough of Cardiff, who found that the kidneys showed evidence of damage to the epithelium of the convoluted tubules, many of the cells of which showed necrosis and were desquamated. The liver showed cloudy swelling and some small areas of early necrosis.

The second case was of the pneumonic type, referred to above, in an epileptic aged 16. Toxic damage to the liver and kidneys was evident. The third death was also of the pneumonic type. Material from the liver and kidneys was sent to Dr. Gough and careful

examination failed to show any evidence of toxic change. The lungs at autopsy were greatly congested and œdematous but not pneumonic, and since consciousness was restored before death, acute toxic myocarditis was probably present. Unfortunately no microscopic examination of heart muscle was made. The patient was aged 47.

The first fatal case received 80 c.cm. of somnifaine in 11 days, the second 12 c.cm. in 3 days, and the third 38 c.cm. in 6 days.

CONCLUSIONS

Prolonged narcosis often produces definite improvement—sometimes dramatic improvement—in psychotic cases. The use of insulin with glucose is an advance in treatment, but this form of therapy remains dangerous.

I wish to thank Dr. H. B. Leech, superintendent of the Warwickshire and Coventry Mental Hospital, for permission to report these cases, and Miss Ring, of the nursing staff, for her skilful supervision of the nursing details, the importance of which cannot be over-estimated. I am also very grateful to Dr. Gough, of the pathology department of the Welsh National School of Medicine, for his reports on post-mortem material.

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CLINICAL AND LABORATORY NOTES

THE IMPERFECTLY MIGRATED TESTIS

SOME STATISTICAL DATA

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A RECENT article by Spence and Scowen in THE LANCET¹ has brought out the possibility of success from treating the undescended testicle with gonadotropic hormone. A factor of importance in deciding whether to recommend injection treatment will be, no doubt, the age of the patient. This was brought out by Denis Browne in a subsequent communication.²

In Spence and Scowen's records of 33 boys treated by this method, 25 were under 14 years of age, and I believe that in a good proportion of these the testicle would have descended naturally without hormone therapy. This is not, however, to deny the value and importance of the work of Spence and Scowen in showing us that we have a new and potent means of treating these patients. For some years I have been responsible for the health of boys attending a large secondary day-school in central London and have, in my notes, recorded all cases of undescended testis and noted each year the progress made. The figures obtained are instructive and I record them as a contribution to the subject. They give some indication of the age at which stimulatory treatment should be begun. In studying the figures we must not forget

that a number of boys probably had had undescended testes which had reached the normal position before my first observation.

The records of 2104 boys were examined. Of these, 38 had one testicle undescended (1.8 per cent.); 21 had both testicles undescended (1.0 per cent.). The majority were observed up to the age of 16 and a very few up to the age of 18. The ages at first observation were as follows:—

Age in years.	Cases.	Age in years.	Cases.
8-9	1	12-13	11
9-10	2	13-14	8
10-11	6	14-15	11
11-12	20		

Of 38 boys in whom only one testicle was undescended there was natural descent in 24 (63 per cent.); of 21 boys in whom both testicles were undescended there was natural descent in 14 (67 per cent.). In examining my data however I am able to make further observations and corrections. Ten boys were not seen by me over a sufficient number of years for adequate observation, and six boys fell into the second group of Denis Browne in that the lack of descent was complicated by the presence of a hernia or hernial sac, or operation for such abnormality had already taken place. This leaves 43 boys fully observed, and if the figures are thus revised we find that—

Of 27 boys in whom only one testicle was undescended and no complicating factor was present there was natural descent in 24 (87 per cent.).

Of 16 boys where both testicles were undescended and no complicating factor was present there was natural descent of both in 14 (87 per cent.).

¹ THE LANCET, 1935, ii., 1335.

² Ibid., p. 1484.

The ages at which natural descent occurred were as follows:—

Age in years.	No. of cases.	
	One testicle.	Both testicles.
11-12	2	2
12-13	5	3
13-14	4	1
14-15	7	5
15-16	5	3
16-17	1	1

I have not analysed specifically the age of descent of each testis in the bilateral cases, but from my records can state that up to two years may elapse before one testis follows the other into the scrotum, or one may descend and the other fail to descend. Can we infer therefore that some other factor is present other than a lack of gonadotropic hormone?

I feel justified in concluding from my observations that treatment is not required in these cases until puberty is well advanced, and that up to the age of 16 natural descent is probable. We do not know as yet the full implication of injecting powerful hormones into the growing boy, and I believe it will be wise to refrain from advising their use except from the experimental standpoint until it appears evident that at a reasonable age—e.g., 16 years—natural descent is not occurring. Those boys in whom a complicating factor is present require the advice of a surgeon as soon as the abnormality is discovered.

GADGETS IN PLASTER WORK

By W. GRANT WAUGH, M.D., F.R.C.S. Edin.

SURGEON TO THE MONKWEARMOUTH AND SOUTHWICK HOSPITAL; ASSISTANT SURGEON TO THE ROYAL INFIRMARY, SUNDERLAND

THE use of plaster-of-Paris is becoming rapidly more widespread in this country with the adoption of Böhler's methods and the introduction of the standard Cellona bandage. The removal of the plaster cast at the end of the appropriate period, however, still entails the waste of much muscular effort, time, and temper, usually on the part of some unfortunate ward nurse. Patients with fracture themselves say that removing the cast is the most painful part of the Böhler technique. I have used this treatment for the last six years, after a course of study in Vienna, and it may be of service to describe a few methods which, in my experience, make the manipulation of a plaster cast less of an ordeal to both parties.

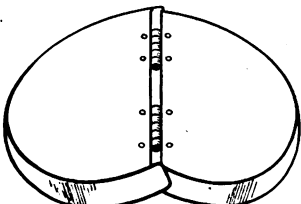


FIG. 1.—The hinged lid.

1. *Cutting a window.*—A window in the plaster is often necessary, for example when compound fracture has been closed by operation, and it is easily cut out if the wound is covered by the lid from a cocoa or other tin and the plaster applied over it. The lid and overlying plaster are excised before the latter has set and the free edges pressed in. A brass lid with a rolled edge, and hinged in the centre to fit the contour of the limb, has been made for me by the Medical Supply Association (Fig. 1).

2. *Cutting instruments.*—In addition to the usual plaster scissors, two curved cobbler's knives, with external and internal cutting edges respectively,

are serviceable, while the discarded scalpel from the theatre is indispensable; but let me utter a warning against the use of the Bard-Parker type, the blade of which is too fragile and may break and lacerate the operator's fingers. The gadget known as the "jigger knife," which carries the Gillette type of razor blade, is, however, safe and very useful; the blades are

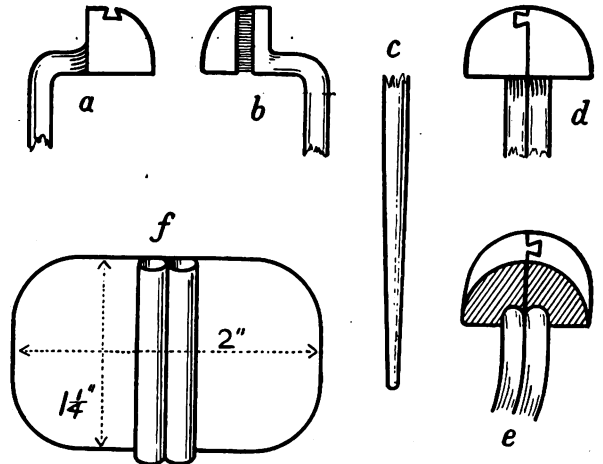


FIG. 2.—The pins.—(a) The head of the left-hand member from the left, and (b) from the right. (c) The tapering end to fit the fixing plate. (d) The heads interlocked; anterior view and (e) posterior view. (f) The fixing plate.

The pins with the fixing plate attached are bent roughly to the shape of the limb and foot, and the plaster is applied over them. When the plaster is drying it is split down the groove between the pins, which are disengaged and lifted out. The pins are made from brass wire (No. 8 S.W.G.), the heads from 1 in. round brass (size of each, 1/4 x 1/4 in.). The pins are conveniently 2 ft. long. The plate is of brass (No. 16 Imp. W.G.), and the tubes loosely fit the ends of the pins. The whole instrument is hand soldered.

sharp and the supply of ammunition is unlimited. The small electrically driven circular saw of German origin is an ideal cutting instrument—apart from the expense. Fretsaw blades are too brittle and usually too short, but the old-fashioned bow saw, with a 1/16 in. blade and 18-24 in. long, can often be used to remove old casts. The blade, covered with a soft metal guard, is "wangled" between the limb and the cast, the bow attached to the ends, and the cast is sawn diagonally outwards.

3. *Splitting the plaster.*—"In every case where a plaster cast is applied before the swelling has disappeared, the cast should be split directly after its application."¹ This is often necessary, and to simplify it I have placed two metal knitting needles on the fleshy part of the limb, bending them to fit the curves and plastering over them; the drying plaster is then cut down the ridge between the pins. As knitting needles of suitable length and calibre are not readily obtainable I have elaborated these into an instrument, the details of which are illustrated (Fig. 2). The pins are 2 ft. long, with interlocking heads, and a slot into which the lower ends fit to prevent spreading. These pins I find of great help, and I use them as a routine in every cast application. They render the splitting of a plaster a rapid and safe procedure.

I am indebted to the Medical Supply Association, who first made a set of Böhler's equipment for me in 1930, for the skill with which they have interpreted these ideas.

¹ Böhler, L.: The Treatment of Fractures. Fourth English Ed. Translated by E. W. Hey Groves. Bristol, 1935, p. 406.

A CASE OF HÆMOPHILIA TREATED WITH RUSSELL VIPER VENOM

BY GEOFFREY A. BAKER, M.B. Durh.

HOUSE PHYSICIAN AT THE TORBAY HOSPITAL, TORQUAY

AND

PAUL C. GIBSON, M.D., M.R.C.P. Lond.

PHYSICIAN TO THE HOSPITAL

THE patient, aged 11, a fat boy with a fair complexion, was admitted to the Torbay Hospital on Oct. 11th, 1935. He has one brother who is said to be hæmophilic and two sisters who are healthy; no family history of blood disease could be obtained from either of his parents. He had been bleeding for ten days from the gum round an upper incisor tooth.

On admission he was collapsed and pale. His mouth was in a septic condition, the gums were inflamed, and he had several carious teeth. A blood examination showed: red cells 4,020,000 per c.mm.; hæmoglobin, 45 per cent.; platelets, 500,000; bleeding time, 3½ min.; coagulation time, 7½ min. No other physical signs were noted.

With an acriflavine mouth-wash (1 in 1000) the gums improved and the bleeding stopped, but it recurred a few days later; and permanent improvement seemed unlikely until the tooth was removed. This and an adjacent tooth were extracted on Nov. 23rd under local anaesthesia. There was no serious bleeding for about eight hours; oozing then began and continued steadily in spite of plugging with, alternately, adrenaline, turpentine, and tannic acid. The blood collected in the receiver was clotted, but the clot was soft and friable. On Oct. 24th a blood transfusion of 200 c.cm. was given, his father acting as donor. Difficulty arose from the fact that the boy's veins were obscured by subcutaneous fat, except in the neighbourhood of the wrist. An attempt to get into one of these veins with a needle failed and so an incision was made just above the wrist. The vein was found to be too small to admit even the smallest cannula, and another incision was made in the antecubital space and the transfusion effected. Both wounds were firmly sutured and a pad tightly applied. In spite of this, oozing began from both incisions; there were now, therefore, three oozing points instead of one. He became steadily exsanguinated, but, owing to the impossibility of getting blood into his vein without making another incision, further transfusion was impracticable.

On Oct. 26th we decided to try to obtain some snake venom. We wired to a firm in London, confirming the order later by telephone, when we were informed that the order would be executed immediately. At midnight a package arrived, but to our dismay it was found to contain a supply of antivenin. By this time the boy's condition was getting desperate. At 9.15 the following morning we telephoned to the pharmacist of St. Bartholomew's Hospital for help. He most kindly undertook to see if any venom could be obtained, and, if not, to send some of their own supply. At 10 a.m. a telegram arrived from Messrs. Burroughs Wellcome and Co. saying that some Russell viper venom, which had been supplied from the experimental stock at the Wellcome Physiological Research Laboratories, Beckenham, Kent, was being put on to the 10.30 train for Torquay. It arrived at 2.30 p.m. and was applied immediately. From that moment we had no further anxiety. Bleeding stopped at all three points and did not recur to any serious extent. The venom was applied, soaked in plugs of gauze, in a dilution of 1 in 10,000; to ensure proper access the stitches were removed from the two wounds in the arm. During the first 24 hours the venom was frequently reapplied and at first there was some slight oozing from the incisions. I think this was because the only way of stopping the bleeding before the arrival of the venom was

by applying continuous pressure, enough to obstruct the circulation; when pressure was released there was considerable hyperæmia for a time. In the tooth sockets, immediately after the venom was applied, a firm elastic clot formed. The wounds healed by granulation in about three weeks.

On Jan. 20th, 1936, some bleeding started round the left lower canine. The tooth was extracted and the socket plugged with venom. There was some slight oozing but this was never serious, and it had completely stopped by Jan. 23rd. He was discharged from hospital on Feb. 3rd.

Special points of interest are: (1) The immediate hæmostasis in the tooth socket. (2) The effectiveness at a site where application was not easily sustained; the tooth socket was shallow and could not be packed very efficiently. (3) The firmness of the clot; this was particularly noticeable in the socket, where the clot felt to be of the consistency of rubber. (4) The complete absence of any undesirable effects, although a considerable amount of the venom had to be used on the arms.

All these satisfactory effects could be expected from the published results of Macfarlane and Barnett,¹ to whom medicine owes this valuable remedy.

We would express our most sincere thanks to the pharmacist of St. Bartholomew's and to the director of the Wellcome Physiological Research Laboratories for the promptness with which they came to our help.

AN UNUSUAL TERMINATION OF CIRRHOTIC SPLENOMEGALY

BY J. F. PATERSON, M.R.C.S. Eng.

CASUALTY HOUSE PHYSICIAN, ST. BARTHOLOMEW'S HOSPITAL

SPONTANEOUS rupture of the splenic pedicle is so unusual that the following case is reported even though no elaborate investigations were made.

The patient, a man aged 27, was riding a motor-cycle, when he was seized with a sudden attack of upper abdominal pain, felt faint, and dismounted. He vomited his previous meal. He was seen by a doctor at the roadside who diagnosed a perforated peptic ulcer and had him taken to the Norfolk and Norwich Hospital. On examination there he was found to be severely shocked and pale. The temperature was subnormal and the pulse rapid. The abdomen was not rigid, but was generally tender and doughy. The spleen was easily palpable and was firm and smooth. There was dullness in the flanks, but the anterior area of liver dullness was diminished. There were no enlarged veins on the abdomen and the superficial lymph glands were not palpable and he was not jaundiced. Intra-abdominal hæmorrhage was diagnosed and the patient died shortly after admission.

Past history.—At the age of 5 he was in hospital complaining of languor and drowsiness. The cervical, axillary, inguinal, and right iliac lymph glands were enlarged, painless, fairly soft, movable, and discrete. The spleen was enlarged down to the umbilicus and the liver was palpable ½ in. below the costal margin with a regular and smooth surface. Blood examination showed hæmoglobin 60 per cent. and a leucocytosis of 16,000. No differential count was done. He stayed in hospital for three months during which time he developed chicken-pox, and on discharge the spleen had apparently decreased in size. He remained apparently well until a few months

¹ Macfarlane, R. G., and Barnett, B.: THE LANCET, 1934, ii., 935.

before his death when he began to complain of vague upper abdominal discomfort. He was stated always to be pale and yellowish.

At autopsy a large quantity of blood lay free in the peritoneal cavity. There had also been a massive hæmorrhage into the retroperitoneal tissues, which had apparently come from the pedicle of the spleen and blood had burrowed under the splenic capsule. The capsule was not ruptured and the splenic artery appeared normal. The spleen was diffusely enlarged and weighed 42 oz. The liver was greatly shrunken

and weighed only 30 oz.; it showed advanced cirrhosis of the hob-nail type. The other organs appeared normal. The lymph glands were not enlarged and there was no evidence of external compression or thrombosis of the portal vein. It was concluded that the hæmorrhage was the result of spontaneous rupture of one of the veins in the pedicle of the enlarged spleen.

My thanks are due to Mr. J. M. Ridley Thomas and Dr. G. P. C. Claridge for their permission to publish the case.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF PSYCHIATRY

At a meeting of this section held on Feb. 11th the chair was taken by Dr. H. J. NORMAN, the president. Dr. E. T. C. SLATER read a paper on the

Inheritance of Manic-Depressive Insanity

Reviewing the history of work in this field, he mentioned E. Rüdin's studies on the siblings of manic depressives, as yet unpublished, and Hoffmann's work on the children of manic depressives, which still remained the basis of much that was taught and written on the subject. Hoffmann had found the enormous incidence of 30 to 60 per cent. of manic depressives among the children of victims of this form of insanity. His work was open to criticism, largely because of the impossibility of knowing what criteria of diagnosis had been used. Hoffmann had regarded cyclothymia and hypomanic and depressive temperaments, even including "quiet humorists," as tainted with manic-depressive heredity, taking an extreme Kretschmerian attitude. His figures were swelled by a tendency to exaggerate normals into abnormals, and abnormals into lunatics. The only other work of importance was that of Banse on the cousins of manic depressives. The value of his work was limited by the large use made of records. Among 1586 cousins he had found between $2\frac{1}{2}$ and $3\frac{1}{2}$ per cent. manic depressives, $1\frac{1}{2}$ per cent. cycloid psychopaths, and 5 per cent. persons likely to carry the hereditary factor. Dr. Slater said that his own research had been done in the same institute and on the same sort of material as Rüdin's and Hoffmann's. He had selected only cases showing some degree of phasic recurrence; at least one clear manic and one depressive attack, or at least three separate depressive or manic illnesses starting before the age of 50. The Kraepelin diagnosis had been taken, concentrating on the course rather than the symptoms. A surprising feature had been the number of schizophrenics among the children. The figures had been corrected to allow for the factor of increasing incidence of the illness with increasing age. Those under the age of 20 were neglected as having yet had no opportunity of developing psychosis, and those between 20 and 50 were reckoned as half. The results showed an incidence of 15 to 20 per cent. of manic-depressive insanity among parents and children of manic depressives. The higher percentage was obtained if a number of cycloid children were included; these might or might not prove to be manic depressive in later life.

The inadequacy of the material, and the difficulties of ascertainment and of obtaining irreproachable statistics had prevented authors from putting for-

ward theories of the genetic basis of manic-depressive insanity. Hoffmann had suggested the existence of three independent factors each carrying different weights, a total weight being required to precipitate psychosis while a lesser weight made the patient a cycloid or cyclothymic. Rosanoff, Handy, and Plessett proposed two independent factors: a cyclothymic autosomal factor and an activating factor in the X-chromosome, both dominant. Rüdin proposed one autosomal dominant and two autosomal recessives. Luxenburger favoured a theory involving one recessive and one dominant.

These theories were quite premature and served no useful purpose. One thing was more or less certainly established: that the psychosis was inheritable and that the inheritance followed a dominant type. The simplest possible theory depended on a single dominant autosomal gene. Until this theory was shown to be inadequate, no other could be even provisionally accepted. On this theory the expectation of manic depressives among parents, siblings, and children of manic depressives would be 50 per cent. All investigations, however, showed a much lower figure. The reasons for the discrepancy were many. A study of manic-depressive twins had shown that only about 70 per cent. of the uniovular twins developed the illness; this gave a direct measure of the influence of environment, expressed as 30 per cent. The expectation among nearer blood relatives was thereby reduced from 50 per cent. to 25 per cent. Another factor was inadequacy of investigation, probably involving considerable failure of ascertainment; another was the genotypic milieu. The genes had to work, not only in an external environment, but also in an internal environment made up by all the other genes which constituted the hereditary structure. In uniovular twins this milieu was the same for both. Genes, moreover, varied in their manifestations, some requiring quite special circumstances for a hundred per cent. influence. The degree of manifestation bore no relation to dominance, and weakly manifesting dominant genes were very common. Probably in manic-depressive insanity the investigator was dealing with a weak dominant gene that manifested itself in only a proportion of its carriers. The psychosis would not appear unless there were present all the genetic factors necessary to allow a hundred per cent. manifestation of the manic-depressive gene. There was also the external environment, the influence of which was illustrated by the greater incidence in women. The great symptomatic variability would be partly caused by the inclusion of what were not really manic-depressive psychoses. No other possible theory would give anything like this same percentage of manic depressives among parents, siblings, and children; it also fitted in with Banse's $3\frac{1}{2}$ per cent. for cousins—i.e.,

just about a quarter of the empirical expectation for the others. Possibly more than one genetic factor could bring about manic-depressive insanity; this was known to be true for other inheritable abnormalities.

A number of observations pointed to a special relation between manic-depressive insanity and schizophrenia, and the relationship could not be altogether explained away on grounds of mistaken diagnosis. In 10 out of the 15 cases where manic-depressive subjects had been found by Dr. Slater to have schizophrenic children, he had been unable to find schizophrenia in other members of the patient's family or in that of the husband or wife. Another curious thing was that manic depressives were scarcer than might be expected among the relatives of schizophrenics, so that the correlation was in one direction only. Manic-depressive insanity did not stand alone in this peculiar relationship to schizophrenia; the relatives of general paralytics and epileptics also showed an increased incidence of schizophrenia. It did not seem likely or desirable to assume that there were common factors in each and all of these cases. Probably a number of genetically different conditions were included under the term "schizophrenia," but in the great majority of cases it was a destructive process affecting the whole personality. It seemed possible that the gene or genes responsible for the development of the schizophrenia would find it easier to manifest themselves in a genetic milieu which included other hereditary factors predisposing to psychic disorder, whether those other factors had actually manifested themselves or not. There was in genetics no very hard-and-fast line between dominance and recessivity. It was quite possible that the presence of a manic-depressive gene might lend the schizophrenic gene a semi-dominance. Some process like this might be responsible for the strange atypical psychoses halfway between manic-depressive insanity and schizophrenia. If the manic-depressive gene had an activating influence on the schizophrenic gene, the majority of the schizophrenic children of manic-depressives ought to be, so to speak, masked manic depressives. In one family where this point had been studied, a woman had a perfectly typical recurrent manic-depressive psychosis; her mother at the age of 34 had had an acute illness with many manic features which had passed on into chronic hallucinosis with many paranoid ideas, and finally into a chronic schizophrenic state in which she had remained until her death at the age of 79. Her mother, the patient's grandmother, had been four times in a mental hospital with recurrent melancholia, and her mother, the great-grandmother, had had one or more psychotic illnesses. Here were four generations showing a typical dominant inheritance with a schizophrene suddenly appearing in the middle but capable herself of continuing the manic-depressive line. Such facts as there were seemed to indicate that there was not an indefinite series of gradations between the normal and the psychotic. If English psychiatrists adopted the view that there was such a gradation, they should be clear about their grounds for doing so.

DISCUSSION

The PRESIDENT said that he saw scope for increased knowledge of the transmissibility of the manic-depressive psychoses in the daily work of psychiatrists, particularly when they were considering the marriage of their patients. Interesting studies could possibly be obtained from historical records of royal houses,

the conduct of whose members was largely public and whose record of intermarriage was clear. The emperor Nero was a case in point: his uncle Caligula had been insane; Drusus, another uncle, had been epileptic; his grandfather had been a man of great arrogance, prodigality, and cruelty; his father had been brutal and reckless of the lives of others; and his mother, Agrippina, had been a prodigy of immorality. Nero himself had been epileptic and had committed suicide in the early thirties.

Dr. AUBREY LEWIS regarded Dr. Slater's paper as the most important contribution to the subject that had yet been made. It was difficult to regard manic-depressive illnesses as accounted for in any single way, whether by a single dominant factor or otherwise. In a certain series he had found that children with one manic-depressive parent had shown a large percentage of cyclothymic and manic-depressive conditions, whereas children of two manic-depressive parents had shown nothing. It was not impossible that a dominant was sometimes present and sometimes not. Whether there was a recessivity was another matter. He had not been entirely convinced by Dr. Slater's reasoning about the relationship between the schizophrenia occurring in the families—the ascendants or descendants—of manic depressives, and the manic-depressive conditions occurring in the propositi. It was useful to consider Kahn's view that the important factor was not so much the presence of schizophrenia as the kind of schizophrenia. If it were the recurrent kind, one might be dealing with a factor common to both conditions which was responsible for periodicity and recoverability, and this factor might be found in schizophrenic strains also.

Dr. C. P. BLACKER hoped that the paper would be regarded by the genetic historians of the future as a piece of pioneer English research. Dr. Slater's hypothesis of a genotypic dominant which was prevented from manifesting itself as a phenotypic dominant through various intrachromosomal, environmental, and physiological factors was ingenious. It was, he thought, difficult to obtain any precise information concerning the genotypic milieu, but some evidence might be forthcoming about the environmental milieu. He asked whether Rosanoff or anybody else had been able to point towards an environmental factor which might have operated in those cases in such a way as to bring out the latent genotypic disposition in one pair of twins as against the other pair—i.e., whether the manifestation of the disease in the affected twin was in any way traceable to environmental strain, shock, or episode. He also asked whether Dr. Slater had been led to suppose that the indubitable cases belonged more to the pyknic type of bodily formation which Kretschmer had stated to characterise manic-depressive persons.

Dr. T. A. MUNRO said that it was possible to get surprisingly accurate information about families in rural areas, provided that one asked at least two and preferably three informants. Country people were anxious to give information about their relatives, and pleased to think that attention was being paid to the insane person in the mental hospital.

Dr. MEYER-GROSS saw more hope than Dr. Lewis and Dr. Blacker of an ultimate explanation of the meaning of the genic milieu. This was not only an interior milieu but might manifest itself in various ways. The different components of the character might one day show the milieu which existed in a single person or a number of persons, so that it

could be judged according to the character components. It might then be possible to say something about the influence of the genic milieu upon the special gene which was being sought.

Dr. H. CRICHTON-MILLER stated that he had recommended a colleague, who had contemplated marriage with a lady whose heredity was suspected of a manic-depressive taint, to read "Chances of Morbid Inheritance." From Dr. Slater's paper it appeared that all the data in this book were founded on erroneous statistics. That was the kind of experience which clinicians had when they came to scientific meetings. The moral was obvious: they should keep away.

Dr. C. W. J. BRASHER considered that statistics could only be valuable if carefully corroborated by personal interviews and clinical experience.

Dr. SLATER denied any implication that he wished to destroy the standing of Hoffmann or anyone else. The great fault of Hoffmann's work had been that he was so Kretschmerian; he would take people of a more or less cyclothymic character and say that they had a manic-depressive taint; this, though possibly correct, was premature. Dr. Slater had found his manic depressives definitely above the social level of their population. Manic depressives tended to be somewhat more pyknic than other people. German workers had frequently neglected the influence of environment, but he doubted whether any information would be forthcoming in the near future on what special environmental factors had an effect on the illness.

SECTION OF MEDICINE

At a meeting of this section held on Feb. 18th the chair was taken by Sir CHARLTON BRISCOE, the president.

Dr. OTTO LEYTON opened a discussion on the morbid conditions which cause

Progressive Hyperglycæmic Glycosuria

and the circumstances which modify its course. Several organs in addition to the pancreas, he said, were involved in impairment of carbohydrate metabolism; hyperglycæmia might be caused by over-activity of the adrenal glands brought about by anxiety, or hypertrophy associated with basophil tumour of the anterior pituitary. Dogs could survive removal of the pancreas if the nerves of the adrenal glands were cut or the pituitary gland removed. Insulin seemed to need something to activate it; an appreciable quantity of insulin might be found in the pancreas of a patient dead from diabetes. If the blood of one animal, A, were led to the brain of another animal, B, and the blood from the pancreas of B conducted to a depancreatized animal, C, B's head being connected to its body only by the vagus nerve, it had been shown that when sugar was added to the blood of A the blood from B to C contained insulin. The complementary experiment showed that injection of insulin into A caused a rise of sugar in the depancreatized C. Some stimulus therefore passed down the vagi to the pancreas. The brain centre which could stimulate the production of insulin could also perhaps inhibit it. Section of the splanchnic nerves seemed to make the body more sensitive to insulin. Sodium chloride might to some extent replace cortical extract in Addison's disease and insulin in diabetes mellitus. Occasionally a case of basophilism lost glycosuria after deep irradiation of the pituitary gland. The posterior lobe of the pituitary also elaborated a

substance which neutralised insulin. Trauma as well as tumours might lead to hyperglycæmia. The thyroid encouraged glycogenolysis, and therefore hyperglycæmia, as long as there was glycogen in the liver.

The question arose whether insulin was essential to the metabolism of carbohydrate. There might, weight for weight, be more insulin in the kidney than in the pancreas of a healthy animal. The experiments reviewed, said Dr. Leyton, suggested that insulin was not essential, or that other cells than those in the pancreas could make insulin. Pancreatic cells were very sensitive to toxins, including those of the common cold, and to over-stimulation. The essential treatment of diabetes, it was now recognised, was to rest the pancreas and give it a chance of rejuvenating. Amelioration was most probable if the sugar content of the patient was kept low. Little success had been obtained from pancreatropic hormone, but cure had been ascribed to pancrealytic serum. A very small number of cases were benefited by irradiation of the pituitary. Partial thyroidectomy and section of the splanchnic nerves might reduce the number of doses of insulin, but did not modify the course of the disease. The number of injections required could be reduced by giving a suspension of insulin in castor oil, or protamine insulinate. Both preparations had a delayed effect. They would, however, only act in certain cases. Reduction in dosage of insulin might also be possible with a glucose diet.

THE CONTRIBUTION OF THE "SOIL"

Dr. J. GRAHAM WILLMORE stressed the necessity for some constitutional fault in the individual to sensitise the soil for the seed. As observed among war pensioners, the "causes" of diabetes seemed to be: mental stress, resulting in chronic progressive endocrine imbalance; retained bits of metal or dead bone in old gunshot wounds with recurrent flares; unbalanced diet, especially excess of fat; arterial degeneration with good living; and hæmochromatosis. In some cases stimulation of the adrenals through the sympathetic nervous system and thyroid caused excessive glycogenolysis, with which the pancreas strove to deal by increased production of insulin. Chronic overwork caused eventual breakdown. The diabetic pensioners all had good war records of constant "front line" work. Gunshot wounds around the pituitary caused endocrine imbalance, but these patients responded to insulin as well as others did, provided there was no intercurrent sepsis to neutralise the effects of insulin. Possibly the pituitary secreted a hormone which acted as a brake on the pancreas; this might be absent in obese young people, and overwork of the pancreas ultimately ended in diabetes. The patients whose old wounds flared up now and again for no obvious reason had a different bacteriology every time. Not infrequently the flare-up was followed by heavy glycosuria and ketonuria requiring temporary or permanent administration of insulin. The blood-sugar must be kept low, under frequent control investigations, and to do this all sepsis must be eradicated. The sugar was more easily controlled if the patient received the first dose of insulin on awaking from sleep, instead of after a little activity. In the diabetic the liver did not seem to know when to stop in producing the glycogenolysis needed for the transition from sleep to waking.

DIFFERENTIAL DIAGNOSIS AND PROGNOSIS

Dr. H. P. HIMSWORTH observed that "progressive hyperglycæmia" had never been observed clinically

or experimentally; he presumed that it meant hyperglycæmia progressing beyond normal limits. If there were several conditions producing "diabetes" there must be varying prognosis and treatment. It was already possible to distinguish certain clinical types of hyperglycæmia which were not diabetes mellitus. It was impossible at the acute stage to distinguish between cellulitis causing glycosuria and mild diabetes complicated by cellulitis. Many cases of hyperthyroidism had difficulty in dealing with sugar. If a patient was mistakenly given a diabetic diet and insulin, not being really diabetic, his blood-sugar might show a suspiciously "diabetic" curve. On an ordinary diet he would show normal curves. It was unsafe to assume that a person took a normal amount of carbohydrate by choice; healthy people rarely took above 300 g. of carbohydrate a day and many people only took 100 g. An increase of carbohydrate often abolished post-prandial glycosuria. Such cases of mistaken diagnosis accounted for reports of the cure of diabetes. If they were given insulin the sugar-tolerance curve was made very much worse. The curve was high in most cases of spontaneous hypoglycæmia. A person who tolerated large doses of insulin was not necessarily a diabetic.

Dr. T. C. HUNT mentioned the prognosis of hyperglycæmic glycosuria as seen in a number of untreated and treated adult cases. Of the untreated, about a third got better and only a half got worse. Of treated cases about 30 per cent. got worse. The factors affecting prognosis might be found in causation or course. Of the improved cases only a few were overweight or neuropathic, and nearly 70 per cent. were over 50 years of age. Of those who did not improve, a third were overweight, a half were neuropathic, and the majority were under 50. If the glycosuria were noticed in the course of an infection

the outlook was usually good; if it were noticed during mental shock, the patient seemed not to do so well. An onset associated with dyspepsia was found in some cases; biliary drainage in two of these had revealed an associated external pancreatic disorder, but, on the whole, stimulation of the external secretion did not affect the internal secretion.

DISCUSSION

Dr. RONALD JONES described experiments he had done on pituitary hyperplasia in hyperglycæmia, which he did not regard as significant. Injection of extracts produced no change in the blood-sugar of dogs or patients. There seemed in fact to be no such thing as a pancreatropic hormone.

Dr. E. P. POULTON asked for details of the patients subjected to deep pituitary irradiation, and observed that Joslin had examined severely shocked men coming back from the front line and had never found glycosuria. Perhaps people reduced their carbohydrate because there was a pernicious doctrine going about that carbohydrates were no good.

Dr. LEXTON recalled a fat patient who used to develop hypoglycæmia when normal saline was injected. Some people had very poor power of storing carbohydrate throughout their lives, and the title had been chosen to exclude these stationary hyperglycæmias. The sugar-tolerance test had been abandoned by him as a diagnostic measure, except for purposes of exclusion. X ray therapy had only been used in cases of basophilism.

Dr. WILLMORE observed that his pensioners had all been normal before the war and had developed diabetes during or soon after it.

Dr. HIMSWORTH said that all over the world since 1900 there had been a progressive change in diet, in the direction of decrease of carbohydrate and increase of fat.

REVIEWS AND NOTICES OF BOOKS

Treatment of Acute Poisoning

BY H. L. MARRIOTT, M.D., M.R.C.P. Lond.,
Resident Medical Officer, Middlesex Hospital;
Assistant Physician, Miller General Hospital,
Greenwich. London: Published for the Middlesex
Hospital Press by John Murray. 1935. Pp. 45. 5s.

The idea of treating a case of acute poisoning conjures up for most of us nightmares of stomach-pumps, of long lists of poisons and their antidotes, of home-made emetics and antidotes, and of the indications and contra-indications of gastric lavage. It is curious that such anachronisms as are embodied in the standard accounts of this important branch of medicine have apparently satisfied the inquirer for many decades, especially when it is realised that for long carbon monoxide has held pride of place among the causes of accidental or suicidal poisoning, at any rate in this country and in America.

Dr. Marriott in this monograph strikes at the roots of the worn-out doctrines repeated from text-book to text-book and builds a new and rational concept based on the treatment of several hundred patients at the Middlesex Hospital. He has assumed reasonably enough that even if the identity of the poison is known, the antidote is either not remembered or is not at hand. The principles underlying the

successful treatment of acute poisoning are found in the three questions which the medical attendant should put to himself in every case: Is the patient asphyxiated or suffering from poisoning by a gas? If the poison was not gaseous, how did it enter the body? Is life endangered by coma, dehydration or dechloridation, pain, or delirium, and convulsions? It is a measure of the success of Dr. Marriott's elucidation of these matters that the substance of his principles could be condensed into small compass, for of all branches of medicine, this is one in which the physician is called to deal with a desperate emergency with little time to think and even less to look up references. But here is not merely a reconstruction of indications; there is supplied, with chapter and verse, the exact technique of the various procedures to be used by the physician. Furthermore, the author has devised a new method of gastric lavage which if adopted as a routine should save many a patient recovered from his poison from death through broncho-pneumonia. Medicine is already indebted to Dr. Marriott and his collaborator, Dr. A. Kekwick, for the method of blood transfusion by the drip method which he published in our columns last year (*THE LANCET*, 1935, i., 977) and which has rapidly gained general recognition as the method of choice in suitable cases. We now have to thank him for a work which reduces to order and reason a section of medicine hitherto disorderly and irrational. This manual is a landmark in the literature of the therapeutics of poisoning.

Diseases of the Chest

By J. ARTHUR MYERS, M.D., Professor of Medicine, Preventive Medicine, and Public Health, Minnesota Medical School. New York: National Medical Book Co. Inc. London: H. K. Lewis and Co. Ltd. 1935. Pp. 385. 13s. 6d.

A GENERATION ago tuberculous infection was considered to be almost universal by the time adult years were reached, and a positive tuberculin reaction was only considered important in quite young children. Prof. Myers takes up an entirely different position. He argues that as the dangerous reinfection type of tuberculosis can only occur after the tissues have been altered by the primary infection, all positive reactors should be kept under careful observation. In such cases an X ray film of the chest should be made at least every year and preferably every six months on persons after the age of 10 years. Heimbeck's observation that amongst young nurses it is mainly those who have escaped a childhood infection who became ill with pulmonary tuberculosis does not fit in with Prof. Myers's theory, and it is a pity that this work is not even referred to. Until more definite evidence is brought forward to show that tuberculous disease is *less* prone to affect those who escape childhood infections, the expenditure of the very large sums of money, which would be required to keep some millions of healthy positive reactors under medical supervision, does not seem justifiable. The remainder of the first section of the book deals with the physical signs and symptoms and treatment of pulmonary tuberculosis; the advantages of early treatment by artificial pneumothorax are stressed and the indications for the various procedures of thoracic surgery are clearly given.

Non-tuberculous diseases of the chest are the subject of the second part of the book. Both serum treatment and artificial pneumothorax receive favourable mention in the treatment of lobar pneumonia; in the latter procedure not more than 200 to 300 c.cm. of air should be introduced at a time; two or more refills may be necessary at intervals of 12 to 24 hours.

In the discussion of the treatment of bronchiectasis, empyema, and pulmonary abscess, conservative measures are first described, but the indications for surgical intervention are also given and a brief account of the methods used. Diseases due to mould-like bacteria, true moulds, and yeast-like fungi are dealt with in a short but adequate chapter illustrated by several skiagrams of these rare diseases. The concluding chapter on diseases due to inhalation of dust brings into association such ill-assorted conditions as hay-fever and silicosis. The book is well illustrated and has a full index as well as a bibliography, mainly American, at the end of each chapter.

Painful and Dangerous Diseases of the Ear

By R. R. WOODS, M.B., F.R.C.S.I., Surgeon in Charge of the Ear, Nose, and Throat Department, Sir Patrick Dun's Hospital, Dublin. London: Humphrey Milford, Oxford University Press. 1936. Pp. 188. 15s.

A DIFFICULTY which confronts the specialist in a teaching hospital is to decide how best to impart a useful knowledge of his subject to the future prac-

itioner. If he attempts to cover the whole of the speciality in the limited time available, the instruction is likely to be superficial and allows far little discrimination between matters of clinical importance and those with which the general practitioner is rarely concerned.

Mr. Woods has written this book to fill the gap between the larger manuals of otology, which contain much material of interest only to the specialist, and the student's handbooks, which tend to treat essential subjects with insufficient detail. He has fulfilled his intention most admirably, and has produced a lucid account of the common forms of suppurative disease of the ear, for his plan amounts essentially to a description of these affections. We could have wished, however, that more consideration had been given to the important point of when to operate in acute mastoiditis. Mr. Woods does say that "it is inadvisable to operate on a case of mastoidism, for the course of the disease after operation may be stormy," but he fails to emphasise the fact that operation for acute mastoiditis is rarely necessary in the first week or ten days from the beginning of the otitis, that a proportion of these cases recover without operation, and that the course after over-early operation is likely to be tempestuous. We have seldom read a clearer exposition of the intracranial complications of aural disease, while the short final chapter on the cerebro-spinal fluid is most valuable. It is wise to have made no attempt to describe details of the major operations, but an account of their after-treatment would have been helpful. There are some good illustrations in the text, and 24 coloured pictures showing the otoscopic appearances of various conditions of the drum.

We recommend this book to the practitioner who wishes to gain a sound knowledge of the more important forms of aural disease that he is likely to encounter.

1935 Year Book of the Eye, Ear, Nose, and Throat

By E. V. Z. BROWN, M.D., Professor of Ophthalmology, and LOUIS BOTHEMAN, M.D., Assistant Professor, University of Chicago; GEORGE E. SHAMBAUGH, M.D., Clinical Professor Emeritus; ELMER W. HAGENS, M.D., Assistant Clinical Professor; and GEORGE E. SHAMBAUGH, Jr., M.D., Clinical Instructor of Otolaryngology, Rush Medical College of the University of Chicago. Chicago: The Year Book Publishers; London: H. K. Lewis and Co., Ltd. Pp. 638. 10s. 6d.

THIS issue of the Year Book, which consists as usual of abstracts from the current literature, discloses this year no notable advances or striking new methods but gives evidence of great activity in the exploration of the fields covered by these specialties, and particularly of research into the intricate physiology of both the hearing and balancing functions of the labyrinth. The abstracts are well chosen and well written and, as in former years, shrewd editorial comments on the more important of these add to their value. The editors plainly show their dislike of early operation in acute mastoiditis. They quote statistics from an article in an English journal of 91 cases, in 73 of which the duration of the otitis media varied from two to eight days; of these cases five died from meningitis, one developed suppurative parophthalmia, and the average time of complete healing with a dry ear was ten weeks; and they very

properly point out that these figures would be very much improved if operation were delayed, when the duration to complete healing is normally about three weeks. This is a convincing argument against early operation in acute otitis, but we believe that the editors are not correct in thinking that early operation is practised frequently in England. A number of articles dealing with malignant disease of the throat and its treatment by surgery, diathermy, and radiation are summarised, and are a useful guide to the present position of the treatment of these conditions. Indeed, the Year Book, with its very full index, is a most valuable book of reference to the newest work.

1. Commoner Diseases of the Skin

By S. WILLIAM BECKER, M.S., M.D., Associate Professor of Dermatology in the University of Chicago. New York: National Medical Book Co. Inc.; London: H. K. Lewis and Co., Ltd. 1935. Pp. 283. 13s. 6d.

2. Common Skin Diseases

Third edition. By A. C. ROXBURGH, M.D., F.R.C.P., Physician in charge of the Skin Department, and Lecturer on Diseases of the Skin, St. Bartholomew's Hospital. London: H. K. Lewis. 1935. Pp. 377. 15s.

1. THE claim advanced by the author that "intensive study of functional diseases in all fields of medicine has tended to clarify and simplify the study of dermatology," does not solve or appreciably lighten the many problems of the therapist, although it opens up new avenues for research.

This is not a book for beginners. A knowledge of histology is presumed, for no microscopic appearances, even of the fungi, are portrayed. A discursive style is adopted throughout, headings and sub-headings are avoided, and the aim appears to be to interest rather than instruct. The subject matter is considered in 26 chapters. The first is given to the care of the skin and scalp, in which the author stresses the differences of response of the ichthyotic and the seborrhœic person. The second chapter discusses the complexities of the eczema-dermatitis group, under the general heading, Toxic Dermatoses of Epidermal Origin, and succeeds in presenting a fairly comprehensible picture of this still somewhat obscure reaction. Infantile eczema is included in this section, and the paragraphs on differential diagnosis, prognosis, and treatment are models of brevity and succinctness. "Stasic" (? static) ulcers of the leg afford the author an excellent opportunity of proving his originality. "Most of our patients with leg ulcers do not have varicose veins, and most of those being treated for varicose veins do not have leg ulcers." Aphorism or epigram—the statement will be substantiated by all who have had much experience in the O.P. clinic, and are not the slaves of text-book assertion. Chapter V., which is constantly referred to in the rest of the text, is essentially a monograph on the neurodermatoses, which evidently have been especially studied by the author. A diagrammatic representation of his conclusions (facing p. 64) will provide the reader with much food for thought, and a commonsense plan on which to base his treatment of an increasingly frequent epidermal syndrome. The following two chapters extend this field of functional skin disease to a degree which to those graduating from the schools of Hebra or Unna may appear somewhat dangerous. Pruritus ani, and pediculosis vulvæ, pediculosis capitis, dyshidrosis (surely a retrograde step?), and "neurotic" excoriations are all included and given pride of place in this group. Beginners

who come across this work should beware of adopting too literally opinions, which to the seasoned observer seem more conjectural than convincing. Succeeding chapters on the papulo-squamous eruptions, physical (e.g., light produced) dermatoses, vascular, pyogenic, mycotic, and parasitic diseases follow more orthodox lines. A chapter on the "skin in industry" and an appendix of simple formulæ conclude a volume which will prove of value to the more advanced student or teacher of an increasingly important branch of medicine.

2. The practitioner will find in this book, which has achieved three editions in as many years, all the information he is likely to need on the practical side of dermatology, and more than he is likely to be able to apply in therapeutics. The illustrations are excellent, and have been increased in number. A new feature, and one that must have given the author much labour, is the duplication of all prescriptions in metric as well as in apothecaries' weights and measures. It is one which is certain to appeal to the continental reader, and maybe, render a translator's task less difficult. The addition of a paragraph on gold dermatitis, now supplied, was badly needed, for it is probably one of the most frequent if not the most troublesome of all drug eruptions at the present time. As an introduction to the study of dermatology there is no better manual in the English language.

Prescription Writing and Formulary

The Art of Prescribing. By CHARLES SOLOMON, M.D., Assistant Clinical Professor of Medicine, Long Island College of Medicine. London: J. B. Lippincott Company. 1935. Pp. 351. 21s.

NEARLY every text-book of prescribing published in the last thirty years has deplored the habit of using ready-made formulæ, particularly those dispensed in compressed form as tablet, pills, and so forth. It has been reiterated that if the physician is to be independent of the complex pseudo-mysteries of the drug factory, he must be able to write a prescription, with the implication that the education of the medical student is defective, in so far as it relates to prescription writing. Dr. Solomon evidently subscribes to this opinion, and has prepared this volume with a view to providing a sound scientific basis for prescription writing. The work is indeed wonderfully complete. The introductory chapter includes a brief account of the history of the prescription, a discussion of a number of important practical considerations, and a useful review of methods of administration. The second part contains everything anyone need know about prescription writing, including dosage and incompatibility. The rest of the book consists of a formulary which contains a very large number of prescriptions of the more commonly used drugs. These are arranged systematically according to the therapeutic effect expected of the drugs, and are printed both in Latin and in English. The author is careful to point out that they are not intended to be set or standard prescriptions, but rather to illustrate the simplicity of rational prescribing. At the same time, the young practitioner will find in them a comprehensive source of information. To add to the usefulness of the formulary, an index of prescriptions according to symptoms and diseases has been included, as well as a general index. The book as a whole perhaps contains too much information for the needs of the medical student, but should prove a handy work of reference for the practitioner.

THE LANCET

LONDON: SATURDAY, FEBRUARY 22, 1936

THE GENTLE SURGEON

OUR readers will be grateful to Mr. FAGGE, Hunterian orator this year, for his scholarly picture of one of the great figures of Victorian surgery. JOHN HILTON was a truly great man, but, lacking perhaps the spectacular personality of many of his contemporaries, he has never received that recognition which his merits demand or his influence on surgical thought and practice would justify. His name is known to every student in Hilton's method of opening an abscess; his lectures on Rest and Pain are familiar in name to the majority, and in substance to the more industrious. But his contribution is more than a technical device and a series of clinical observations, many of which have been disproved by later knowledge. The quotation which heads the oration gives a clue to the spirit that animates all HILTON's writings, a spirit that shows him to have been a scientific and thoughtful surgeon, perhaps the first of a type, which, it is to be hoped, characterises the best of surgery to-day. To say that he was the first implies no disparagement of JOHN HUNTER. HUNTER was an intellectual giant; he moved and thought on a higher plane than other men, and the standards by which we judge them seem to fit him not at all. But his great and restless spirit was engaged upon the problems of disease in general, while HILTON's gentle and practical mind studied the more intimate problems of Nature's own surgery as exemplified in the patients who came under his care. HILTON was no mean anatomist, as his numerous dissections, immortalised in wax by the art of JOSEPH TOWNE, bear witness to-day. But he was very much more. His interest in the body was not confined to the study of its dead framework, and to the discussion of theories as to how structures ought to work which had ceased to do so; he watched these same structures in life, striving to learn for himself how they carried out their duties in health, and how they attempted to repair their injuries. He was the first physiological surgeon, set apart from his fellows by his faith rather than his works. They study attack, he defence; they consider what can be done to an organ, the limits of its endurance, the best approach to it, the instruments and methods of anæsthesia suited to the enterprise they contemplate; he considers how it works in health, how its working has been modified or vitiated by disease or injury, how it is attempting to repair or circumvent the damage it has suffered, how best he himself can aid these efforts, or how imitate the normal function if repair is impossible. His handling is characterised by a regard for the tissues as purposeful, almost sentient agents of repair. Above all things he is gentle.

Many, especially those who have passed through the wards within the last five years, will consider that gentle handling is the aim of every surgeon. That this spirit should be abroad to-day is the greatest monument to HILTON's influence, for it has not always been so. Surgical history indeed contains the names of others who thought as HILTON, of men who have spoken as did AMBROSE PARÉ: "I dressed his wound; God healed him." But most of the older surgeons were men of action rather than of thought, as they had to be before anæsthesia or antiseptics were known. The tales that come down to us are of uncouth choleric men, of retorts whose discourtesy has made them classic, of bold and skilful but brutal manipulations, of blood and agony, of boastful self-assertion, of fierce quarrels, of chicanery and nepotism. It might have been expected that gentleness would come when anæsthesia had abolished the need for speed; but the same agent made more extensive operations possible, so that the need for speed remained. With the coming of asepsis, a whole new field of operative work, as yet unexplored, was thrown open. Bold and untried adventures, such as the early exploration of the abdomen, could only be carried through successfully, at a time when anæsthesia was still understood imperfectly and shock not at all, by surgeons who worked at lightning speed. We therefore find that during the first few years of this century the ultra-rapid operator was undisputed king of surgery, or at any rate of surgical practice. Slashing his way through tissues in a manner that would horrify the student of to-day, he was able to show that the operations which have since been perfected were possible. His patients survived, his ventral herniæ were closed by others; and his methods have since been changed beyond recognition.

It is perhaps unduly optimistic to say that rough surgery is extinct to-day. Human nature, and especially adolescent human nature as exemplified by the medical student, will always prefer the spectacular to the artistic, and the gentle surgeon is often a gentle man. He may find to his chagrin that the best students flock where the blood flows most freely, where the shouts are the loudest, where instruments are thrown about the theatre, where "look and see," the infallible solvent of diagnostic difficulties, ensures an abundant succession of tours de force. Yet he has his reward when the same men, older and wiser, come to him as house surgeons and registrars to learn those details of tissue kindness which are unseen from the gallery. For this Hiltonian surgery is taught and propagated by apprenticeship. Men speak of Halsted technique, Lane technique, Moynihan technique, each meaning the same thing, the standard of work of a great master at whose side he has studied, a standard whose only criterion is that the tissues shall be treated with the greatest gentleness, subjected to the least damage, replaced carefully, apposed accurately—in short, that they shall bear the least trace of the surgeon's passage. Such methods gain adherence by their results rather than their

performance. Their victory is symbolised by the disappearance of the old operating "theatre," suited for the dramatic in surgery, and its replacement by what is almost an operating temple, where the faithful can study essential detail. Their performance is made possible by better anæsthesia and more highly skilled assistance, which have eliminated the need for hurried work, so that only its quality need be considered. Their perpetuity is assured by a new school of young men, trained in the use of their hands at a time when they can acquire the touch of an artist.

The change, like all important changes, has been gradual, but on a ten-year period it is obvious enough. During the last decade operating by the clock has become a bad joke, traumatic muscle cutting and nerve damaging incisions in the abdominal wall have disappeared, hæmorrhoids has become universal, strong antiseptics, purgation and starvation, have been abolished from the surgical ward. If we made the interval of survey 20 years instead of 10, we might have to admit that the surgical registrar of to-day is a better operator than the leading surgeon of 1915. There is still room for improvement, particularly in the technique of those operations which are not considered to be major surgery. Hæmorrhoids are still torn rather than dissected out; the average operation for hernia is still coarse, traumatic, and unphysiological; and even the gentle surgeon is often content to apply his principles to the deeper layers only, forgetting the physiology of the skin and subcutaneous tissues. Yet the day is clearly not far distant when all operations will be done with the unhurried exactness of the surgeon-neurologist, when all scars will be the invisible line of the plastic surgeon. For the beautiful scar is more than a work of art. Wherever placed it is proof of healing, not merely without sepsis but without any recognisable reaction of repair; it is a guarantee of lasting comfort for the patient and of untainted soil for the man who may have to come afterwards. It is the signature of the gentle surgeon.

SHORT-WAVE THERAPY

SINCE J. W. SCHERESCHEWSKY published his first papers on short (wireless) wave therapy in 1926 the subject has become one of clinical and scientific interest, owing to the many reported discoveries and the claims for effective treatment which have been made by research workers and clinicians. While the application of the new therapy requires technique as exacting as that of X ray treatment, it is desirable for all of us to be aware of the principles on which it is based. Short-wave therapy has come to mean treatment with electromagnetic oscillations of very high frequency, corresponding to a wave-length of 2 to 20 metres. The energy is produced by an electronic tube generator or a spark-gap apparatus, the principle in each case being similar to that of the wireless transmitter, with the fundamental difference that the energy so produced is not radiated by an antenna but is utilised in the body

of the patient in the following way. The characteristic feature of a so-called resonance-circuit, consisting of self-inductance coil and condenser, is the fact that when the self-inductance and the capacity bear a certain simple relation to the wave-length the most part of the produced energy is absorbed. It is always possible to satisfy this numerical condition and thereby to bring the resonance-circuit into tune with the generator by suitably adjusting either the coil or the capacity. In short-wave therapy the part to be treated is brought into the condenser field, thereby becoming part of the dielectric and also part of the tuned resonance-circuit. The metal electrodes or condenser plates make no direct contact with the skin, being separated from it by glass or some other insulating material, and whereas in other electrical methods of treatment the electric energy may be regarded as flowing through the body, in short-wave therapy it appears to act directly on each element of the tissue between the plates. The amount of energy absorbed in this manner at a given point depends on a number of more or less independent factors, such as uniformity of field, dielectric constant, high-frequency conductivity, colloidal structure, potential gradient, but to the best of our present knowledge it is practically all converted into heat. Theoretically the choice of wave-length is a critical factor, but experts are not in agreement how this effect of wave-length is to be utilised in treatment. Substances with different physical constants, placed in the condenser field under the same conditions, are heated to different degrees; for each substance there is a definite wave-length with which, for a given field strength, the heat produced is maximal. If a mixture of different substances is brought into a condenser field, one or other of them can be heated differentially, provided the proper wave-length is selected, whatever its position in the field in relation to the other substances.

Now the human body consists of a number of tissues with different physical constants—fat, muscle, bone, blood, and so on, and if the facts just mentioned are accepted it should be possible to heat one tissue differentially whatever its position in the body. This has been done in treatment of the kidneys within the intact body—it was found possible to coagulate kidney-tissue without burning the skin—showing how potent a weapon has been put in our hands with which to influence deep-seated processes. Indeed, the importance of the new therapy lies in the possibility which it provides of introducing large quantities of thermal energy into the interior of the body without unduly heating the skin and the superficial fat. Much research too has been done on the influence of short waves on animals, bacteria, colloids, and other biological substances. One of the chief problems was to find out whether the effects produced were due exclusively to the production of heat, or whether there might be a "specific" effect which cannot be attributed to heat. Opinion is fairly divided on the point, but it seems that the behaviour of bacteria and certain chemical effects can only with great

difficulty be explained without presuming some form of specificity.

Important as these problems are, the practitioner is more anxious to be told what kind of disease can be successfully treated by short-wave therapy and what advantages, if any, the treatment may have over other methods of applying heat. It may, we think, be taken for granted that the possibility of direct heat formation in any deep-seated organ must have important consequences. The range of indications is widened by the inclusion of organs which could not be reached by diathermic treatment; chronic inflammation in bones, joints, tendons, sinuses, and internal organs, including the lung, is known to have responded favourably to short-wave therapy, and sometimes where every other treatment had failed. Striking results are claimed for sciatica and neuritis, and some diseases of the arteries, and whereas diathermic currents cannot be applied with impunity to acute inflammatory processes, short-wave therapy scored its first successes in the treatment of boils, carbuncles, and cellulitis. Those who wish to pursue the subject further will find excellent and detailed information in several books recently reviewed in our columns.¹

SEX AND CULTURE

THE word "sublimation," borrowed from chemistry, has been adopted by psychologists to describe the process by which the energies of sexual impulses which are denied direct outlet can be applied to non-sexual or social ends. In the years immediately following the war, when the writings of FREUD were being actively debated in this country, the conception of sublimation did something to mitigate the harshness of psycho-analytic theory, and it was much stressed by those who desired to reconcile the lessons of medical psychology with the religious and moral aspirations of civilised man. But few attempts were made to bring the idea of sublimation as understood by psychologists into relation with the new science of social anthropology. A noteworthy contribution to this aspect of the subject was made by Mr. J. D. UNWIN, Ph.D., in a long and painstaking treatise² embodying ideas which, previously summarised, had already evoked critical and appreciative discussion. The suggestion, he tells us in a preface, had been put forward by analytical psychologists that, if social regulations forbid direct satisfaction of the sexual impulses, the emotional conflict thus generated is expressed in another way, and that what we call civilisation has been built up by compulsory sacrifices in the gratification of innate desires. His monograph is the result of an attempt to test this hypothesis by reference to cultural data.

The task is one of quite unusual difficulty and complexity. The first and perhaps the most formidable difficulty which confronted the author was to devise satisfactory criteria of what respectively constitutes cultural progress and sexual

opportunity. The available evidence fell under two main headings—historical and anthropological. The historical evidence was found to be too unwieldy, partly because of its bulk and partly because of the cultural stratification which exists in all civilised societies and makes it impossible to generalise about the cultural stage reached by any civilised society taken as a whole. Dr. UNWIN therefore confined himself to anthropological data. When we talk about the cultural stage reached by an uncivilised society, what do we mean? The following restricted definition is presented: "We can sum up the matter," he writes, "by saying that to the members of every uncivilised society a certain power . . . manifests itself . . . in the universe, and that steps are taken to maintain a right relation with it. . . . The evidence is that different societies conceive of these powers in different ways and adopt different methods in their efforts to preserve a right relation with them. The manner in which the powers are conceived, and the steps which are taken to maintain this relation, constitute the cultural condition of a society in the sense in which the phrase is used throughout this thesis" (our italics). Uncivilised societies are then divided into three groups—described as deistic, manistic, and zoistic—depending on whether they build temples—which are carefully defined (deistic), whether they pay post-funeral attention to their dead without building temples to them (manistic), and whether they do neither. Much careful thought and writing is devoted to describing and differentiating these three cultural conditions. But a definition of what is meant by sexual opportunity is no less necessary to the argument. Dr. UNWIN found it necessary here to limit his discussion to the prenuptial opportunity afforded to females; evidence of an objective, or, as Dr. UNWIN prefers to call it, a behaviouristic character, is only available here, and he points out that the limitation is not as arbitrary as might at first appear, because the sexual opportunity afforded to males in a given society is a reflection and corollary of that afforded to females. First, young women (and therefore young men) may be sexually free, being checked in no way from any sexual activity or play; secondly, prenuptial intercourse may be limited, for a young woman, to a certain man (the restriction imposing correlative restrictions on the males in her community); lastly, the girl may be compelled to maintain her virginity until she is married, it being required that tokens of virginity be required on the nuptial mat. In assessing these groupings, the existence of certain specific exogamic relations and prohibited degrees are always taken into account and no notice is taken of the compulsory continence inflicted by these. The remarkable conclusion emerges that the correlation between the cultural stage attained by a given society and the degree of prenuptial restraint imposed upon its females is complete. Throughout the 80 societies of which the required information was available it was found that each of the three types of sexual opportunity was invariably accompanied by one of the three types

¹ See THE LANCET, Nov. 16th, 1935, pp. 1125-26.

² Sex and Culture, London: Humphrey Milford, Oxford University Press. Pp. 676. 36s.

of cultural behaviour. Societies which permitted prenuptial freedom were in the zoistic condition; those which inflicted an irregular or occasional continence were in the manistic condition, and those which insisted on complete prenuptial continence were in the deistic condition. In each society the converse obtained; the correlation found indeed was so complete as to astonish the author, who, in his preface, declares that if he had realised, when he embarked on his task, how greatly he would have to revise his social philosophy, he might have hesitated to begin it.

At a recent meeting of the medical section of the British Psychological Society Dr. UNWIN's conclusions³ were keenly though sympathetically discussed. Their extraordinary importance, if true, for all departments of human aspiration and endeavour was acknowledged by Prof. J. C. FLUGEL, who described their implications as at once hopeful, startling, puzzling, and depressing. Hopeful because the work implied a new phase in coöperation between anthropology and clinical psychology. Startling because the definiteness of the results was without parallel within the domain of the purely human sciences. Puzzling because they went too far; for, if the correspondence between sexual limitation and cultural achievement was so complete, psychologists must all have been wrong about the existence of other factors. Depressing because of the unpleasing clarity with which the ethical alternatives of pleasure or progress

³ Dr. Unwin's address at this meeting has since been published as a brochure, "Sexual Regulations and Cultural Behaviour" (Humphrey Milford, pp. 62, 2s. 6d.), which is a summary of the evidence and conclusions contained in his treatise.

as the summum bonum were put before the human race. "To puritans of all denominations," he said, "as well as to the more fanatical enthusiasts for progress, Dr. Unwin's views should be most welcome, since they seem to provide at once ample 'scientific' justification of the demand for purity and abstinence together with a sure recipe for further cultural advance. These same views, however, are likely to cause consternation in bohemia." And at the same meeting Mr. R. E. MONEY-KYBLE, Ph.D., questioned the validity of the causal relation which might be thought to subsist between compulsory sexual continence and social progress. They might both be collateral effects of some other cause.

Dr. UNWIN's book is the product of ten years of industrious research. It marshals a wealth of carefully digested facts. It is written with a clearness and conciseness very rare in works of this length. The author is acutely conscious of how, in anthropology as well as in psychology, loose thought can be embodied in a loose usage of words. The precision with which he defines his terms and phrases, while making difficult reading of some of the chapters, will provide intellectual pleasure to many critical readers. Some no doubt will extend the field of comparison to other manifestations of sex and to other aspects of culture. Some will analyse the same data to see whether they cannot be interpreted in other ways. Whatever may be the outcome Dr. UNWIN has shown himself a pioneer in a new and very interesting branch of statistical sociology, and his book may well exercise an important though unobtrusive influence upon social and moral thought in the next generation.

ANNOTATIONS

THE WORD "VENEREAL"

A CHANGE in the title of the *American Journal of Syphilis and Neurology* to the *American Journal of Syphilis, Gonorrhoea, and Venereal Diseases* for discussion, in the January number, on the meaning of "venery" and "venereal." Strictly speaking the terms refer to the worship of Venus, and so their connotation covers the art of love in wedlock as well as outside it. But the "Oxford English Dictionary" brands them with the stigma of lust in quotations as early as 1610; and there is no doubt that popular feeling for centuries has limited their meaning to illicit intercourse and the diseases that arise therefrom. The six generally recognised as venereal are syphilis, gonorrhoea, chancroid, lymphogranuloma inguinale, scabies, and pediculosis pubis; and it will at once be observed that most of them can be acquired without any suggestion of venery. It is therefore natural that well-meaning people should wish to drop a word which casts a slur on the good name of many innocent people. With this in mind attempts have been made from time to time to suppress altogether the word venereal as an "offensive outworn relic of the Victorian age." Indeed it has been said that the association in the lay and medical mind between venereal disease and sexual guilt is so close that no great advance in control is likely to take place until the name has been changed.

Now it is a common weakness of human nature to try to substitute a new or more respectable word

for one that has lost its character. Sometimes the effort is successful, especially if it is a new word such as Fracastor's "syphilis" for *Morbus Gallicus*. Sometimes it is tolerated, as when we substitute hospital for infirmary or asylum. Sometimes it is just stupid, as when we say "officer" for policeman. A recent manifestation of this futility is the suggestion that venereal diseases should be called "social diseases." If such an attempt were made all we should succeed in doing would be to degrade a comfortable pleasant word like "social" without making any difference to the public outlook on the conditions in question. For our part therefore we are not in favour of suppressing the word venereal, covering as it does a well-defined group of diseases, several of which can be acquired together. Instead we think that it will survive, because of its age and usefulness. One regret, however, may nevertheless be associated with this belief. Those of us who have strong feelings about the marriage of Greek and Latin might be tempted even to sacrifice venereal if we could thus guarantee to slay the barbarous hybrid "venereologist."

DEATHS ATTRIBUTED TO ANÆSTHESIA

The second Emsley memorial lecture delivered at Melbourne in September last¹ gave Dr. Z. Mennell, its deliverer, an opportunity for expressing his views on several questions both of the physiology of anæ-

¹ *Med. Jour. Australia*, 1935, **xxii**, (2), 801.

thesia and of matters germane to the practice of anæsthetics, such as coroners' inquiries. After paying due attention to Embley's well-known work in connexion with the cause of death from chloroform, the lecturer gave interesting and valuable examples of causes of death during anæsthesia which are probably often overlooked because they are not sought for with the microscope, by which means alone they can be detected with certainty. Two causes, of which he cited examples and in illustration of which he showed slides, are fat embolism and air embolism. The symptoms exhibited by a patient who died on the operating table were so unlike those attending other fatalities which Dr. Mennell had seen associated with anæsthesia that he found himself unable to give the coroner any opinion as to the cause of death; nor was this demonstrable from the post-mortem inquiry until days after, when slides had been prepared by Prof. Dudgeon. These showed fat embolism to such a degree that, the lecturer said, "there must have been several pounds of liquid fat present." It is not very unusual for deaths during anæsthesia to be unexplained by the naked-eye post-mortem examination, and the conclusion is commonly drawn that the death resulted from a fatal effect of the anæsthetic, presumably on heart or respiration, which is not demonstrable after death. Dr. Mennell has done a service if he has enforced on all concerned the need for more searching inquiry into the causation of these "anæsthetic" fatalities.

TREATMENT OF ENLARGED PROSTATE WITH MALE HORMONE

THE thesis that some kind of endocrine dysfunction is responsible for benign enlargement of the prostate has attracted much attention from experimentalists in recent months, and was briefly discussed in our columns as recently as Feb. 8th (p. 321). The general opinion is that the hyperplasia is a response elicited by œstrogen compounds, but McCullagh and Lower^{1,2} elaborate a contrary view that it results from imbalance between two separate normal testicular hormones, secreted by the seminiferous tubules and by the interstitial cells. It will be recalled that Dr. Paul Niehans accepted this view in his paper recommending treatment by "Steinach's ligature II"; but it must be admitted that the evidence in favour of the existence of two such hormones is still somewhat indirect. Gonadectomy in both male and female rats leads to enlargement of the pituitary and to enhancement of its gonadotropic powers. If two rats, the one castrated the other normal, are experimentally combined in parabiotic union, the accessory reproductive organs of the normal animal become hypertrophic, presumably because its gonads are stimulated by the excess of gonadotropic hormone elaborated by the castrated animal's pituitary. If, however, enough male hormone is injected into the castrated animal to save its prostate from hypertrophy, its pituitary does not become over-active, and the accessory reproductive organs of the normal member of the parabiotic pair do not enlarge. These observations show that testicular hormone influences both the accessory reproductive organs and the pituitary, and the presumption is that while its effect on the accessory organs is to increase their activity, its effect on the pituitary is an inhibitory one.

McCullagh argues that two distinct substances,

with sharply different functions, are responsible for these separate effects. This opinion is founded chiefly on changes observed after irradiation of rats' testes with X rays. Such irradiation leads to degeneration of the tubular elements, while the interstitial tissue remains normal and the accessory reproductive organs hypertrophy. The pituitaries of the irradiated animals also become over-active, in the same way as the pituitaries of castrated animals. Thus a single experimental procedure enhances one testicular function (promotion of growth of the accessory organs) and depresses another (inhibition of pituitary hyperactivity). Indications of similar differential changes in testicular function are provided by other experiments, and McCullagh therefore concludes that the interstitial tissue of the testis elaborates a hormone which governs the well-being of the accessory reproductive organs, while the tubular system produces a hormone which prevents the pituitary from becoming gonadotropically hyperactive. As he himself points out much remains to be done, not only in the provision of new data, but also in the confirmation of older findings and in the resolution of conflicting observations, before this hypothesis can be regarded as sound. Despite these uncertainties, however, McCullagh and Lower advance the following conception of the ætiology of benign enlargement of the prostate. The condition, they suggest, is due to insufficient production by the testes of a hormone—to which they give the name "inhibin"—which normally prevents the hypophysis from secreting too much of its gonadotropic principle, and to a consequent hypophyseal over-activity which stimulates excessive production of the testicular hormone concerned with the growth and maintenance of the accessory reproductive organs, including the prostate. If this view of the ætiology of enlarged prostate is correct, the obvious treatment for the condition is administration of the testicular substance "inhibin." This substance, however, has never been isolated; and accordingly, in his investigation of 76 patients, Lower had to compromise by giving each the equivalent of 60 grammes of fresh beef testicular material daily. Some of the patients at the beginning of the trial suffered from complete retention of urine, while others had nocturnal frequency and varying amounts of residual urine. Nevertheless as many as 48 reacted favourably, the improvement of symptoms being usually manifest within a week or ten days after treatment was started, and the maximum being reached within 4-6 weeks. But unfortunately the improvement was almost entirely symptomatic, for the size of the prostate, as determined by rectal examination, had as a rule not altered, nor had any histological changes been induced.³

Although he does not favour it, Lower is alive to the possibility that his therapy may actually have been an unimportant factor in the symptomatic improvement of his patients. This is undoubtedly the safe view to take in the absence of any knowledge of the efficacy of crude testicular extracts when given by mouth. In any case, even assuming that the treatment was of value, it is obvious that the material administered may have been useful not because of its problematical inclusion of a substance "inhibin," but because of the male hormone proper which it almost certainly contained. The ætiological hypothesis postulated by McCullagh and Lower is in no way supported by whatever success their treatment

¹ McCullagh, D. R.: Cleveland Clin. Quart., January, 1936, p. 3.

² Lower, W. E.: *Ibid.*, p. 11.

³ Lower does not state how histological material was obtained.

may have gained, since male hormone is also indicated in the management of benign enlargement of the prostate on the view that the condition results from the prolonged activity of oestrogens. It is idle, however, to speculate, in the present state of knowledge, on these various issues. One thing only is plain. Several hypotheses regarding the aetiology of enlarged prostate have implied that male hormone would be of use in the treatment of the condition. Information about the chemistry and biology of male hormone compounds has also multiplied rapidly in the past year. It is time, therefore, that male hormone was given a fair and adequate clinical trial in those conditions which experimental work suggests may benefit from its use.

WHOOPIING-COUGH AND THE PUBLIC

IN spite of unanimous medical opinion, and the evidence of statistics to the contrary, the public of most countries continues to regard whooping-cough as a disease of little account. Dr. F. Barbary, of Nice, in a communication¹ to the Paris Academy of Medicine, deplors the indifference shown in the rural districts of France. Evidently an optimist then, he is disappointed now, seeing that since he drew attention to the matter ten years ago nothing has been done. Dr. Barbary alludes to the well-known fact that the actual numbers of cases and deaths from whooping-cough far exceed those known to the sanitary authorities. From personal inquiry he found that, although very few cases had been notified voluntarily, several hundreds of children had been attacked by the disease in the district he surveyed and of these many had died from pneumonia or broncho-pneumonia, the true cause of which, namely whooping-cough, had not been revealed on the certificate. Dr. Barbary advocates the education of the public by means of addresses and handbills. In his view, it is essential to explode the legend of the efficacy "du fameux changement d'air," since removal of the child results not in the amelioration of the attack but in the spread of infection to a fresh locality. He deprecates, too, the practice of permitting children suffering from the disease to play with others in the street. At intervals, games are interrupted while the sufferer, during a paroxysm, sprays his playmates with infection. It should be impressed upon the public that a few minutes' contact with an infective child are sufficient for the transmission of a disease which, far from being trivial, may result in fatal complications. Dr. Barbary declares for compulsory notification in order that specific measures may be taken for the detection of suspects and the protection of contacts. Early diagnosis is facilitated by the cough-plate method and should be followed by isolation. For the contacts Dr. Barbary advocates either passive immunisation by means of convalescent serum or active immunisation by means of vaccines.

The problem of the control of whooping-cough in rural France presents the same features in urban England. It is true that in the large cities a commencement towards its solution has been made by hospitalisation upon a fairly large scale; at the present time, for example, not far short of 700 children suffering from whooping-cough are in the wards of the infectious diseases hospitals of the London County Council. Since, however, as is the case in measles, patients are removed to hospital only when the phase of maximum infectivity has passed, hospitalisation is mainly a curative measure.

Vaccine prophylaxis, when adequately attested, may provide the real solution of the problem if the public, as the result of education, agrees to the necessity.

A PIONEER OF ACTINOTHERAPY

A MEMORIAL to Albert Jesionek in the *Münchener medizinische Wochenschrift* of Jan. 31st is a worthy tribute to the work and personality of an outstanding dermatologist of modern times. In this country he will be remembered chiefly for the remarkable results he obtained in all forms of cutaneous tuberculosis by purely "natural" means—viz., diet and sunlight—at his Lupusheilstätte at Giessen. In this achievement his clinic was probably unique, for his energies were concentrated on the dermatoses; neither pulmonary nor articular cases, as in many other "biological" institutes, shared the available space and facilities. Jesionek was a long way ahead of his time in formulating his problems and visualising them broadly as biological. He was no slave to this or that type of diet, lamp, or local application, and he was rarely seen at medical congresses with some new gospel of cure or prevention. He preferred the quiet atmosphere of his now famous institute at Giessen, and consistently refused the offer of larger and more important spheres of scientific activity. He will be remembered with Finsen, Rollier, and the other pioneers for his services to actinotherapy and the management of cutaneous tuberculosis.

ASPIRATION FOR MAMMARY ABSCESS

DISSATISFIED with the results of incision and drainage in a carefully controlled series of 42 cases of abscess of the breast, Mr. R. J. V. Battle and Mr. G. N. Bailey resorted to aspiration and lavage of the abscess cavity.¹ As irrigating fluid they used at first "bouillons vaccins," and later Dakin's solution, and they report results from aspiration which compare favourably with those of incision. To their recommendation of aspiration as a routine treatment there are exceptions—notably the very large abscess that results from neglect of a small, localised one, and the diffuse cellulitic type of infection which shows poor localisation and severe constitutional reaction from the start. The combination of a virulent infection with a poor physical condition probably accounts for the incidence of this type of breast infection. In general, Battle and Bailey believe that the cause of breast abscess is engorgement followed by infection of the stagnant secretion by organisms present in the ducts or gaining access to them by way of the nipple. Cracks of the nipple increase the liability to infection in so far as pain leads to curtailment of suckling and hence to engorgement. Aspiration is most successful when infection remains localised, but watch must always be kept for multiple infection. Where the suppurative process is of the cellulitic type it is better to incise and explore with the finger until all pockets have been opened into one main cavity. Before starting aspiration, the baby is taken off the affected breast, which is emptied by a pump. Battle and Bailey use a 25 c.cm. syringe and a needle of 2.5 mm., and they have two or three of such needles in readiness. They prefer a syringe with a Luer fitting instead of the Record, which is too narrow in calibre. The breast surface is cleansed with ether, and a point with definite fluctuation, or, in patients seen before this is present, a point of maximum tenderness, is selected. Novocain (2 per cent.) is injected through the tissues down to the abscess cavity. The wide-bore needle is inserted, the pus aspirated, and an equal quantity injected

¹ Bull. Acad. de Méd. de Paris, 1936, cxv., 192.

¹ Brit. Jour. Surg., January, 1936, p. 640.

of Dakin's solution, diluted half and half with water. A sling supports the breast and the patient is re-examined in 24 hours. Further aspiration and injection is undertaken if pain returns from increased tension in the breast, if tenderness persists or returns, and if the temperature does not fall satisfactorily. Two or more areas of tenderness can be aspirated separately and the Dakin's solution washed to and fro between the cavities. Repeated aspiration is required in most cases. Incision is necessary if, in spite of repeated aspiration and careful search for hidden loculi, the condition fails to settle.

"Bouillons vaccins" were given a fairly extensive trial and the results were satisfactory. The method used was that described by V. Riche and E. Mourgue-Molines, except that non-specific vaccines were employed in some cases, and, incidentally, with results superior to those with the "bouillon vaccin No. 31" recommended. Special permission from the Ministry of Health is required to import these products and customs duties have to be met. Dakin's solution was found to be more practicable and to give good results, hence it was preferred. Weaning of the baby and the provision of extra nourishment and of general ultra-violet radiation proved useful in some of the more severe cases.

RESPIRATORY EFFICIENCY TESTS FOR EACH LUNG SEPARATELY

MENTION has already been made in these columns of the bronchoscopic methods devised by Jacobæus and his colleagues whereby the vital capacity and other measurements could be obtained individually for the right and left lungs. Bezançon and his associates recently reported¹ to the French Academy of Medicine their experiences with a modification of the original scheme. To avoid any risk of injury they have employed a standard bronchoscope of normal calibre (7 mm.) and catheterised the lungs consecutively rather than simultaneously as in the method devised by Jacobæus. Once the bronchoscope is in the main bronchus insufflation of a rubber bag round its end blocks all exit of air except through the tube, and the expired air can be collected and analysed so as to give exact data on pulmonary ventilation. The present communication is based upon the examination of 30 patients most of whom suffered from pulmonary tuberculosis. A close connexion was usually found in this condition between X ray findings and the measurements of pulmonary ventilation, but the functional activity of a diseased lung sometimes turned out to be higher than radiography had indicated. This could either mean that this lung was less damaged than appeared, or, alternatively—since figures obtained were not absolute but relative for the two lungs—that the apparently sound side was not contributing to the total pulmonary ventilation as large a share as radiographic and physical examination would suggest. Interesting comparisons are made between pulmonary and renal disease as estimated by efficiency tests. For example, in pulmonary tuberculosis lesions apparently limited to a relatively small area have been found to be associated with a substantial decrease in functional activity, whereas patients with lung abscesses apparently involving a large area of tissue may show comparatively little change in the proportion of pulmonary ventilation carried out by the diseased and the normal lungs. The same thing happens in the kidney, where non-tuberculous suppuration causes less interference with renal efficiency than a

tuberculous lesion. An extreme example of interference was seen in a patient with a neoplasm of the lung in whom respiratory function was almost suppressed on the affected side.

More work is required to clear up the many unsolved problems. For instance, separate study of the ventilation of each lung often shows that elimination of carbon dioxide and intake of oxygen are diminished in different proportions, and the question arises whether there can be a different respiratory quotient for the two lungs.

AMBULANCE SERVICES IN ETHIOPIA

THE British Red Cross Society's second ambulance unit, destined for Gondar on the north-western front, landed at Port Sudan on Feb. 16th. The officer-in-charge is Dr. Percy James Kelly, C.B.E., and he is assisted by Dr. Robert Blackwood Robertson. Three non-commissioned officers, formerly R.A.M.C., accompany the unit and two Indian sub-assistant surgeons are proceeding from Kenya to join them, as well as nine native dressers. Captain Strudwick, the transport officer, is already in the Sudan making all transport arrangements—a vital and extremely difficult task. It is expected that the unit will have reached Gondar and be ready to begin work early in March. Meanwhile the first unit,¹ under Mr. John Melly, has moved from Dessie, where it was originally stationed, to Waldia, and treated 2000 cases in the fortnight following its arrival. It is now preparing to move some sixty miles further north to Quorem on Lake Ashangi to work as a clearing station for wounded from the Makale front. Mr. Melly reports that the unit is working smoothly, in spite of rains and almost insuperable transport difficulties. Unfortunately, however, it is found that the very severely wounded, being unable to walk, never reach a dressing station at all, and either die from their wounds or have their sufferings ended by their comrades. The wounds of those who reach the unit—many of them caused by bombs—are always in an advanced state of sepsis and immediate amputations are often necessary. The civil population are beginning to bring in their sick at the rate of some 90 new outpatient cases a day, and the members of the unit are called upon to treat many types of tropical disease. The varied equipment with which the unit is furnished is standing them in good stead, but a portable X ray set has been found to be a necessity, and a set which is being specially manufactured will be dispatched within a few weeks in the charge of an experienced radiologist. Public response to appeals for funds, including a broadcast address by the Very Rev. H. R. L. Sheppard, has covered the expenses already incurred in dispatching the two units, but money is still urgently needed to ensure that their work shall be adequate and uninterrupted throughout a campaign which at best is bound to cause widespread suffering for many months to come. This work is carried on under difficult and dangerous conditions and the units have to depend entirely on supplies sent from this country, so that the British Red Cross Society has to find at least £3000 a month for their maintenance in the field.

It is also announced that a party of British nurses is being formed under the leadership of Gertrude Lady Decies to join the Ethiopian Red Cross in the war zone. This is separate from the British Red Cross units (composed only of men) and no general appeal for funds has yet been made; but a sum of £2000 is

¹ The first unit is composed of the following medical men: Mr. John Melly, F.R.C.S., Dr. A. C. W. Barkhüus, Dr. C. E. Bevan, Dr. W. S. Empey, Dr. J. W. S. Macfie, and Dr. John Perverseff.

¹ Bezançon, F., et al.: Bull. de l'Acad. de Méd., 1936, cxv., 12.

needed, of which a quarter has already been subscribed. Among other voluntary efforts of the same kind we may lastly mention the veterinary unit organised by the R.S.P.C.A., which has lately sailed with all that is necessary to staff and equip a field hospital for 250 sick animals.

A PIONEER ALMONER

Miss Anne Cummins died on Feb. 8th, 1936; her life's work remains vigorously alive. In the future she will be remembered, not as the first almoner, for the profession was actually ten years old when she was appointed at St. Thomas's Hospital in 1905, but as the first almoner with imagination vivid enough to realise the potentialities of hospital social work and in large measure to turn her vision into reality. She saw the work not as a series of sporadic acts but as an essential hospital service ancillary to medicine and nursing and for the benefit of all patients. So quickly did she inspire others with her belief that in 1909, only four years after she had started her work at St. Thomas's Hospital among the out-patients, she was able, thanks to the newly formed Northcote Trust, to carry systematised social work into the wards and into special departments, finally creating in the hospital a complete system of medico-social service which still remains in many ways unique. This success was largely due to the enthusiasm for the work and loyalty to her ideals that she was able to kindle in successive generations of her staff. Those who came to her for wise advice, whether patients, fellow-workers, nurses, or doctors, always left her fortified and stimulated. Her influence extended far beyond the bounds of the hospital. Since 1905 Miss Cummins has played a part in almost every big movement touching the health of the people. Very early she stressed the special importance of social work for the patients suffering from tuberculosis and venereal disease, and was responsible for starting the special hostel connected with St. Thomas's and for the liberal and educational lines on which it has been run. The development of maternity and infant welfare centres owed much to her; and it was she who arranged that fathers as well as mothers came to classes and lectures at the little welfare centre near the hospital. Miss Cummins had nothing parochial in her outlook; she saw the hospital as part of a larger whole. She worked continuously for coöperation and understanding between State and voluntary organisations, and knew how to give as well as to get the best from societies and individuals for the patient in need. From the first she strove for the adequate training for almoner's work, and her own preparation for the work at St. Thomas's Hospital was both long and arduous. In 1907 she was instrumental in forming the Institute of Hospital Almoners for the selection and training of students and for maintaining professional standards of work, and after her retirement from St. Thomas's Hospital in 1929 her work for the institute was perhaps her greatest interest. She lived to see the profession of hospital almoner spreading over the whole of Great Britain, not only in voluntary, but in municipal and mental hospitals, and the development in at least one of our dominions of an institute for training on the English pattern.

SERUM TREATMENT OF TYPHOID FEVER

LAST year Mr. A. Felix, D.Sc.,¹ and Dr. C. J. McSweeney² reported in our columns the results of early trials of a new antityphoid serum prepared by Dr. Felix, and at a meeting of the fever hospitals

group of the Society of Medical Officers of Health on Jan. 31st the same workers gave an account of their further experiences. Felix's investigations with Weil on the H- (flagellar) and O- (somatic) antigens have long been familiar, and more recently he has identified in *Bacillus typhosus* a third antigenic component which he calls the Vi-antigen. While O-antigen is chiefly responsible for toxic symptoms, the Vi-antigen is specially associated with virulence, and he maintains that a therapeutic serum to be of value must contain effective amounts of both O- and Vi-antibodies. Clinical trials of his new serum in Palestine and Egypt have been "definitely encouraging"; both toxæmia and pyrexia were favourably influenced. Comparative trials by Dr. Samy Bey Sabongi of Cairo of commercial serum containing O-antibody in low titre, special serum with O-antibody in high titre, and a third serum containing both O- and Vi-antibodies are held to have demonstrated the superiority of the last. The same kind of serum, at first unconcentrated but later concentrated and of very much higher Vi- and O-titres, has been used by Dr. McSweeney in Dublin in 19 cases of typhoid fever. Although in 10 of these there was unequivocal evidence that the period of pyrexia was shortened, McSweeney found that the effect of the serum upon toxæmia was more striking and more constant than its effect on temperature. Indeed he considers it so potent a weapon in combating toxæmia that its routine use is justified, especially if toxæmic features are in evidence. In the course of the discussion Dr. E. W. Goodall recalled the use of Chantemesse's anti-exotoxic serum (1906) and MacFadyen and Hewlett's anti-endotoxic serum (1908); the latter he had used with good results, and he had also seen benefit from the injection of vaccines. From the examination of 66 case-records he concluded that in 25 instances Felix's serum had proved beneficial, but whether the Vi-serum was superior to the O-serum he was not sure. Dr. A. Joe, who had also examined the records, said he thought that, on the whole, the results were encouraging and that a good case had been made out for extensive clinical trials of the new serum, which, he added, might now be obtained commercially. Hitherto the serum has been injected intramuscularly, but Dr. Stanley Banks suggested that still better results might be obtained from intravenous or intraperitoneal injection. Dr. McSweeney, who admitted to less courage, did not share this view.

WE regret to announce the death on Feb. 7th of Dr. Priestley Leech, consulting surgeon at the Royal Halifax Infirmary, and medical officer in charge of the Venereal Diseases Clinic.

ON Thursday, Feb. 27th, and on the following Tuesday at 5 P.M. Dr. E. L. Middleton will deliver the Milroy lectures to the Royal College of Physicians. He will speak on industrial pulmonary disease due to the inhalation of dust, with special reference to silicosis.

Sir Lenthal Cheatle will deliver the Hunterian oration of the Hunterian Society at the Mansion House at 9 P.M. on Monday, Feb. 24th. His subject will be John Hunter's Time and Ours.

AMIDOPYRIN, after May 1st next, will not be on sale to the public except on medical prescription. That is the day on which the new Poisons List and Rules come into force, and the decision was announced last week by the Home Secretary in reply to a question in the House of Commons (see p. 456).

¹ THE LANCET, 1935, i., 799.

² *Ibid.*, 1935, i., 1095.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXXXIX.—PROGNOSIS IN ENLARGEMENT OF THE SPLEEN*

THE spleen is a composite organ, composed of several tissues which are also to be found elsewhere in the body, and the diseases which involve the spleen affect these tissues not only in the spleen but wherever else they occur. The main tissues which make up the structure of the spleen are:—

1. The *hæmopoietic or blood-forming tissues*—occurring in the bone-marrow and spleen-pulp and (in conditions of disease) elsewhere as well, e.g., the liver.

2. The *lymphoid tissues*—occurring in the spleen as the Malpighian bodies, and elsewhere as the lymphatic glands and lymphoid nodules abundantly scattered through the organs.

3. The *reticulo-endothelial tissues*—occurring as the cells lining the splenic sinuses, as the Kupffer cells of the liver, in the bone-marrow, and elsewhere.

4. The *vascular structures*—arteries with their peculiar endings in "ellipsoids," veins, blood-sinuses. The spleen is in direct connexion with the portal venous system, and is of necessity involved in diseases and abnormalities of that system.

5. The *supporting tissues*—capsule, trabeculæ, and reticulum of the pulp.

Thus the real problems of prognosis arise in diseases affecting other parts or tissues of the body, but in which the same tissue in the spleen takes a share. It may be, and often is, that splenic enlargement is the most obvious clinical sign, but the prognosis is that of the whole disease. The real crux of prognosis is accurate diagnosis, and this may be excessively difficult. I have, in association with various co-workers (Cashin, McMichael, Salah), investigated a large number of spleens removed in Great Britain by operation or at necropsy, and have published accounts of attempts to classify them on a pathological basis. Many of them have been enormously enlarged, but some have been normal in size. So far it has been found quite impossible to make any clinical classification of real value to physicians, and in only a minority of splenic conditions can an accurate diagnosis and a name be given.

In practice, however, prognosis can conveniently be considered under three headings—namely, what happens: (1) when the spleen is left alone; (2) when splenectomy has been performed successfully from the surgeon's point of view; (3) when other treatment, such as by X rays or drugs or other measures, is employed. The conditions in which the various essential tissues of the spleen are involved, and the prognosis in each, will be considered in relation to these three lines of treatment.

Hæmopoietic and Lymphoid Tissues

It is convenient to consider the hæmopoietic and lymphoid tissues together. Here we are concerned with prognosis in all the leukæmias, and certain of the anæmias. It is perhaps easiest to include acholuric jaundice in this group also, but no one at present knows the real causation of this fairly common disease.

The prognosis in all the varieties of *acute leukæmia* is bad, and no treatment applied to the spleen or elsewhere is of any avail. In the *chronic leukæmias* (both myeloid or spleno-medullary and lymphatic),

treatment applied to the spleen has a notable effect on prognosis. We have seen in the last decade an enormous improvement in the results of X ray therapy in these diseases. Everyone is agreed that the prognosis as regards the general health of the patient is vastly improved; not everyone is agreed that the span of life is actually prolonged. The problem is difficult because of the great variation in the expectation of life in untreated patients, particularly those suffering from chronic lymphatic leukæmia. I am convinced myself, from my own observations, that in chronic myeloid leukæmia life is actually prolonged, in addition to good health being temporarily restored, by radiotherapy. As to chronic lymphatic leukæmia, an individual physician does not see enough cases to enable him to form a proper judgment. Instead of being anæmic invalids patients may now hope to continue active work for five, six, or even seven years in the myeloid variety, and still longer in the lymphatic. My longest case of myeloid leukæmia is still alive at the end of seven years. Nevertheless, it must be admitted that in all chronic cases of leukæmia the *ultimate* prognosis is bad, and the onset of hæmorrhages generally shows when the end is approaching. A point of interest is that it seems to be treatment by X rays *to the spleen alone* which is of value in myeloid leukæmia, although so far as we know the actual disease is chiefly in the bone-marrow. It does not seem to matter much whether the spleen becomes shrunken to nearly normal size by the therapy, or remains large—the good result is the same. In chronic lymphatic leukæmia, of course, the position is different, and here X ray therapy should be applied both to the spleen and to every lymphatic gland found to be enlarged.

Hodgkin's disease is a difficult problem in prognosis, for if left untreated it may run an acute or a very chronic course. Its ætiology and even its nature are still obscure. In the spleen it involves the lymphatic elements (the Malpighian bodies), and elsewhere the lymphatic glands and all lymphoid structures. How does X ray therapy affect the prognosis in this disease? Opinions vary, but my own is that in the more chronic cases well-applied X ray therapy, carried out in the closest association with the clinical laboratory, is of great value in prolonging life. This close correlation, with regular blood counts, is essential. Care must be taken, when treating the enlarged glands and the spleen, that the blood-destroying effects of X rays are not carried too far, to produce both severe anæmia and leucopenia, and actually hasten the end. In the past most of us have made mistakes in this way.

Splenectomy has no influence on the prognosis either in the chronic leukæmias or in Hodgkin's disease.

Erythræmia (Osler-Vaquez disease) is a disease associated with great splenic enlargement. In this condition splenectomy is valueless, X ray therapy offers little help, and blood-destroying agents such as phenyl-hydrazin are uncertain and at times even dangerous because of our difficulty in knowing when the hæmolytic action of the drug will stop. Symptomatic treatment by repeated venesection is the only method which has proved regularly helpful in my hands, and I believe improves prognosis in that it tends to prevent well-known complications.

* Enlargement of the spleen associated with tropical diseases is not discussed in this article.

Acholic jaundice (congenital or, rarely, acquired) may be dealt with here for convenience. We know that clinically these patients suffer from periodic attacks of blood destruction, resulting in hæmolytic anæmia and hæmolytic jaundice, and that the spleen is enlarged. We know too that in a test carried out under entirely artificial conditions the washed red blood corpuscles, deprived of their plasma, are unduly "fragile" when compared with the red blood-cells of normal people. Whether the red cells are unduly fragile, in the same sense, within the body, and when bathed in plasma, is quite a different problem, no matter how important the test may be for diagnostic purposes. We also know that splenectomy breaks some link in the chain, and prevents, nearly always, the return of the sudden "blood crises," with blood destruction and jaundice. I formerly believed that splenectomy was an absolute cure for these blood crises, but a single case still under observation has shown me that the rule is not invariable. For practical purposes, however, splenectomy is a true clinical cure for this disease, although when tested after the operation the red cells remain throughout life as fragile as ever.

Prognosis as regards life when splenectomy is not carried out is more difficult to assess, but it is known that many cases of untreated acholic jaundice live long lives. Various complications, however, such as gall-stones, may ensue at quite an early age. Broadly speaking, the view is now held that splenectomy is indicated, and that when it has been successfully carried out a prognosis of continued good health can be predicted.

The problem of the prognosis of *purpura hæmorrhagica*, in its relation to the spleen, may also be considered here. I have examined the spleens removed by operation from a number of these cases, and in none was the organ enlarged, nor could any microscopic abnormality be made out. Here, if we see aright, is a disease involving the blood-platelets, and their production or destruction, in some unknown way. Splenectomy generally raises the platelet count, and it is for this reason that splenectomy has been used in severe and recurrent cases of purpura. It seems true to say that in purpura hæmorrhagica splenectomy may be a truly life-saving measure; but it is also true that splenectomy does not, in all cases, prevent the recurrence of a low platelet count, and a return of the disease.

Reticulo-Endothelial Tissues

Diseases involving these tissues, in the spleen and elsewhere, include the abnormalities of lipid storage, described by Gaucher, Pick, and Niemann, and also the lipid splenomegaly sometimes associated with diabetes. The spleen is here involved merely as part of a much more generalised abnormality in function of the reticulo-endothelial system of the body. The prognosis, except in diabetes, is on the whole bad, and is certainly, in my experience, uninfluenced by any treatment, even splenectomy.

Vascular Structures and Supporting Tissues

This includes the largest group of splenomegalies met with in Britain, and nomenclature is almost as difficult as prognosis. This is the group formerly referred to in our literature as Banti's disease, or splenic anæmia, but a better pathological description would be hepato-lienal fibrosis. The origin of the splenomegaly is quite unknown, but it seems evident that changes in the vascular structures of the spleen are of great importance. In one group of cases of

this kind, indistinguishable clinically from others, the vascular lesion is actually outside the spleen, and complete thrombosis of the main splenic vein or even of the portal vein is found at necropsy. In most cases, however, the vascular changes are within the spleen itself, and are associated with a gradually progressive diffuse fibrosis. The crucial point in the prognosis is the fact that the liver also tends to be involved, developing fibrosis and ultimately a true cirrhosis. The question of whether the spleen changes come first and the liver changes second is obviously of great importance. It is generally believed that this is indeed the order in most, if not all, cases, and this influences both treatment and prognosis. So far as we know at present, our only chance of preventing the progressive changes in the liver is to remove the spleen, and it is generally impossible in the earlier stages to know, without surgical exploration, whether the changes in the liver have begun. There are two schools of thought at present, one favouring splenectomy and one against it. The only alternative to operation is X ray treatment, and my personal view is that this is valueless.

How can a reasonable decision be made as to whether splenectomy should or should not be performed? Only a very extensive experience could help, and few people see, throughout their clinical life, sufficient cases to enable them to formulate definite rules. It is certain that astonishing results have followed splenectomy in the most unpromising cases, when the liver has been proved to be cirrhotic, and even when ascites has set in. On the whole, however, it must be said that at present the prognosis in this group is poor as regards duration of life, and the average expectation under any treatment is no more than five years.

Prognosis of the Operation of Splenectomy

Obviously a physician is more concerned with the results of successful splenectomy than with the operation itself. Of the operative technique, therefore, I need say little except that shock in the anæmic patient may be considerable, and that a blood transfusion while the patient is on the operating table is, in my view, highly desirable. Two surgical risks are worth mentioning here. Very rarely the splenic vessels in the pedicle are abnormal in their distribution, and instead of one splenic artery and one main splenic vein, there are several. This greatly increases the surgical risks unless the surgeon is aware of it. The only other problem is due to perisplenitis and adhesions, especially to the under surface of the diaphragm, and when these are extensive fatal oozing of blood may ensue, in spite of the most careful surgical precautions. It is in these cases that the simple operation of tying the splenic pedicle, without removing the spleen itself, is to be recommended. This operation has already been carried out with success, and a simple atrophy of the spleen results.

The most frequent and serious post-operative risk is thrombosis of veins, and no operation on the spleen should be attempted when the blood-platelet count is much above the normal 300,000 per c.mm. Following splenectomy the platelet count tends to rise, and if it reaches 700,000 per c.mm. or more the possibility of thrombosis in any vein, but particularly in intra-abdominal veins, at once arises. The thrombosis, if extensive, may be fatal in itself, or lead to hæmorrhage from increased pressure in neighbouring veins.

(Continued at foot of opposite page)

SPECIAL ARTICLES

MEDICINE AND THE LAW

"Psychic Pain"

INJURY entitling a workman to compensation need not be physical and visible injury. In a recent Manchester case a porter, while moving a bale of cloth weighing about 50 lb., had fallen and strained his back nearly a year ago. He was in bed for three weeks and then attended hospital until December. He complained of great stiffness in the lower part of the back; he walked in a very bent position and very stiffly and always used a stick. Examination disclosed no injury; X ray photographs showed a completely normal condition. The employers refused to pay compensation after Nov. 18th. The workman asked the court to order renewal. A medical witness, called by the employers, said he thought the workman had made up his mind he would never get better; the man himself was the greatest obstacle to recovery; he had got the habit of expecting pain whenever he moved his limbs; it was a "psychic" pain. The judge said there had been a persistent complaint of pain and there was no accusation of malingering; the "psychic" pain was the result of a physical pain, and the physical pain was the result of the accident in the course of the man's employment. An order was made for compensation from the date of discontinuance last November.

It is nowadays too late to contend that a workman cannot have compensation if his disability is due merely to the state of his nerves or to his loss of will-power. In another recent case, heard at Langport county court in Somersetshire, a gardener had slipped on some stone steps while carrying two buckets and had received injury to his back and ribs. When the visible effects had disappeared the workman still complained of pain and loss of sleep. His doctor advised him to try light work in his garden. The man found he could pull up a few weeds but could do no digging. The Medical Referee, acting as assessor, advised the court that it was a case of true neurosis. No fracture was shown by the X ray photographs. The physical disability had passed off, but the fact that the man had both the accident and the pain seemed to make him quite honestly associate the one with the other. The Medical Referee thought the pain would gradually disappear. The man ought to put in as much work as he could in his garden; if he did so, he ought not to suffer at all in three months' time. The judge held that the man was suffering from a nervous result of the accident which, so long as it existed, incapacitated him from work. "I think he has within his own command the power to cure himself; he has no need to wait till some sympathetic employer finds him

(Continued from previous page)

Just as in hepatic cirrhosis of the ordinary kind, hæmatemesis from rupture of veins in the wall of the stomach, or in the œsophagus, is by no means infrequent in cases of chronic splenomegaly, quite apart from operation. It must be stated that splenectomy does not entirely remove this risk, and that hæmatemesis has been known to occur at intervals for years after successful splenectomy.

J. W. MCNEE, M.D., D.Sc., F.R.C.P.,
Physician to University College Hospital.

a suitable job. He has a garden in which he can do the exact work which will prove his cure." The workman was entitled to compensation and a lump-sum payment of £50 was offered and accepted in settlement. The court thus went as far as it could in the direction of advising the man to take up work again. There are decisions which prevent a court from reducing the award of compensation (in the absence of misconduct) in order to put pressure upon a workman to exercise his will-power and to tackle a job of work once more.

Damages against Dentist

At Chester assizes last week substantial damages were awarded against a dental surgeon in respect of injuries sustained by reason of a tooth passing down the patient's throat after extraction and entering the lung. There was evidence that the method of plugging the patient's mouth was satisfactory and that the teeth were counted immediately after the operation. One tooth was then said to be missing and it was found in the lower jaw. Apparently the count was incomplete. Mr. Justice Lawrence had to consider the relative responsibility of dentist and anaesthetist. He held it to be the duty of the dentist to see that the pack used was a proper pack and one which would prevent a foreign body from passing down the patient's throat. The patient was afterwards seriously ill and eventually coughed the tooth out of the lung. He was now well, but he had suffered displacement of the heart, and his lungs had become hardened and deteriorated. A verdict of £800 damages, with special damages of £280, was awarded.

Fall on Polished Floor

Last July Mrs. Weigall was awarded £2826 damages in Mr. Justice Horridge's court against the Governors of Westminster Hospital for injuries sustained through a mat slipping on a polished floor in the hospital's annexe at Fitzjohn's-avenue, Hampstead. She had been to the premises to visit her son who was a patient. Having seen him, she went into another room to interview the consulting surgeon about him. She said she put her foot on a mat near the fireplace and, the mat suddenly slipping on the highly polished linoleum, she fell and broke her thigh. Her left leg was now an inch shorter than the right. The judge held, last July, that the hospital authorities ought to have known that there was unusual danger in placing the mat unsecured on a highly polished floor; there had been a failure of duty towards the plaintiff; she had not been guilty of any contributory negligence. At the trial in July Mrs. Weigall admitted in evidence that in 1911 all the toes of both her feet were amputated except her big toes; but she denied that on this account she was the less able to keep her balance. The defendants had sought to explain her fall as due to a sheer accident for which they were not responsible. The legal position depended upon the plaintiff's right to be there. Was she invited to be in the place where she met with the accident, or was she merely there at her own risk?

The Court of Appeal dismissed the Westminster Hospital's appeal last week. Two judges held that Mrs. Weigall was an invitee. She was visiting the hospital on an express or an implied invitation. Her son was undergoing treatment; she was paying a fee to the hospital and also to the consulting surgeon; there was a contract under which she had an implied

right to visit her son and to consult the surgeon about him. The hospital was therefore under a duty to take reasonable care to make the premises safe and to prevent danger of which it knew or ought to have known. One member of the court, Mr. Justice Eve, expressed the view that Mrs. Weigall was a mere licensee and not an invitee. The opinion of the majority holds the field.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

THE THIRD STAGE OF LABOUR

At last week's meeting of the Edinburgh Obstetrical Society Dr. Chalmers Fahmy read a communication on the management of the third stage of labour. After speaking of the normal mechanism of placental separation, he made a strong plea for allowing the third stage to take place spontaneously and without any interference. In the great majority of cases, he pointed out, the placenta separates without difficulty in less than an hour, and even if separation is delayed for two hours or so, there is seldom much bleeding if the uterus is not manipulated. He emphasised the dangers of prematurely employing Credé's method of expression: the uterus should be left entirely alone until the signs are clear that the placenta has separated, and not until these signs are present should any attempt be made to deliver the placenta, even though the third stage lasts two hours or more. Hæmorrhage in this stage is common if early manipulation of the uterus is practised; it is uncommon if nature is allowed to take its course. The indications for expressing the placenta from the uterus are hæmorrhage, and a placenta delayed for many hours. That expression should always be attempted after 50-60 minutes is a view held by many, but Dr. Fahmy believes this plan to be unwise. A placenta which is adherent at the end of an hour, he said, might not be adherent at the end of the second or third hour. If Credé's method fails, there is hæmorrhage to a degree which leads immediately to manual removal. Experiences were cited showing the safety of leaving the placenta in utero for some hours when the patient can be kept under observation by the nurse or doctor. Many examples were given of patients with "adherent placenta" being sent to hospital after frequent attempts by Credé's manœuvre had failed. Such patients were generally shocked and had bled freely as the result of the attempts; as a rule, the treatment adopted in hospital had been one of rest by morphia. The placenta was usually found in the vagina some hours later.

Dr. Fahmy disagreed with the statement, often made, that the mere retention of the placenta frequently causes shock; such a development was rare. Laceration of tissues and frequent attempts at Credé's expression were the common causes of shock in the third stage. He stated his belief that the early adoption of methods to express the placenta was the cause of much postpartum and third-stage hæmorrhage; such would seldom be seen if more patience were exercised after the delivery of the child, whether the delivery had been spontaneous or instrumental. Manual removal of the placenta either at home or in hospital should be avoided if at all possible; if the placenta were left to separate spontaneously, the need for such interference would seldom arise. A policy of patience that is advocated by all for the second stage of labour should be upheld during the third stage also.

PARIS

(FROM OUR OWN CORRESPONDENT)

LES CAUSES PRINCIPALES DU MALAISE MÉDICAL

WHILE most of us get no further in our diagnosis of the present *malaise médical* than to the generalisation that there is something rotten in the State of Denmark, the biologist, Auguste Lumière, has taken us a step onwards by quoting certain illuminating statistics. One reason why the general practitioner now sits twiddling his thumbs for lack of a more constructive occupation is that crowds of potential patients, tuberculous or conceivably tuberculous, now attend tuberculosis dispensaries or take refuge in sanatoriums, preventoriums, and allied institutions. In 1934 there were 834 dispensaries in which more than a million and a half visits were paid. Of the 890,056 persons presenting themselves at these dispensaries in this year, only 335,199 were found to be tuberculous. Further, in the same year, 1,221,955 visits were paid in the patients' homes by visiting nurses. Institutions of the sanatorium class provided 72,561 beds.

Other statistics, produced by the *Phare Médical de Paris* for January, reveals a big leakage of the general practitioner's sources of revenue in quite a different quarter. In 1920 the number of days spent in the hospitals of Paris was 1 million. In 1933 this number had risen to 13 millions—an average increase of 1 million per year. It has been calculated that about half these hospital patients are paid for by the national insurance scheme out of accident insurance funds, or are able to pay out of their own pockets. If the cost of each day in hospital is some 40 francs, it will be seen that the total sum the taxpayers have to contribute towards the treatment of the sick members of the community is thumping big. It is, however, an ill-wind that blows nobody any good, and though the taxpayer bleeds and the general practitioner starves, the sick themselves are almost to be envied.

EUTHANASIA

On Feb. 6th Dr. Thierry de Martel, the brain specialist and chief surgeon to the American Hospital in Paris, was the guest of honour at the weekly lunch of the American Club. He said that euthanasia had many defenders, but was not yet accepted by the legislature of any country. Might not the day come, he asked, when the doctor would be permitted to give death painlessly, and even agreeably, to the sick who asked for it? Even if euthanasia was to become legal, he did not think its benefits would be as often sought as was commonly supposed, for, in his opinion, men cling to life, no matter how little of it remains to them or how painful it may be. Only once in the course of his career had a patient been sincere in his request for death.

THE HIPPOCRATIC OATH FOR DOCTORS OF MEDICINE

Two French universities have recently decided to require the Hippocratic Oath of medical students before they graduate in medicine. The faculty of medicine of Bordeaux adopted this measure from Jan. 1st, 1936. The text of the Oath must be printed at the end of each thesis, and when it is defended, the candidate must read the Oath standing before the jury. The French faculties of medicine which now require the Hippocratic Oath of candidates in medicine are those of Paris, Nancy, Strasbourg, Bordeaux, Montpellier, Marseilles, and Algiers.

UNITED STATES OF AMERICA

(FROM AN OCCASIONAL CORRESPONDENT)

AN ENEMY OF QUACKS

THE American Medical Association announces that Dr. Arthur J. Cramp is retiring after thirty years' service at its headquarters. Born in London in 1872 the first child in a large family, he was educated at Sir Walter St. Johns and became junior clerk in a London steamship office; but at the age of 19 he abandoned that path of fame and emigrated to the United States. After an American college education he became a teacher and occupied his spare time in contributing a weekly newspaper column. He graduated from the Wisconsin College of Physicians and Surgeons in 1906, and after a brief experience of medical practice became attached to the staff of the *Journal of the American Medical Association*. Very soon after that he developed what was first called the Propaganda and Reform department and is now known as the Bureau of Investigation. The two volumes "Nostrums and Quackery" represent only a small part of his efforts in this field. His office has investigated over 200,000 quacks and quack remedies and maintains a complete file of the records from which information is supplied daily to federal and State health officials, educational institutions of all kinds, editors of magazines and newspapers, and the less easily bamboozled members of the general public who prefer not to swallow every remedy that is baited with a testimonial.

The work will go on, but to those of us who have known it throughout many years the Bureau will never be the same without its genial, courteous, passionately efficient director. Some of his many friends will dare to expect that even in retirement in his new Florida home he will continue to wield his effective pen. A third volume of "Nostrums and Quackery" is badly needed!

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdrs. A. G. Taylor to *Drake* for R.N. Hospital, Plymouth; T. J. O'Riordan and R. J. Inman to *Drake* for R.N.B.; H. L. P. Peregrine to *Osprey*.

Surg. Lt. Comdrs. G. Rorison and L. J. Corbett to *Shropshire*.

Surg. Lt. Comdr. L. Lockwood, M.V.O. (Royal Australian Navy), to *President* for course.

Surg. Lts. H. G. Silvester to *Kempensfelt*, A. J. Glazebrook to *Arethusa*, and W. J. F. Guild and J. G. Slimon to *President* for course.

E. R. Sorley, J. M. Sloane, T. F. Crean, W. P. E. McIntyre, E. T. S. Rudd, E. H. Rampling, E. E. Malone, L. P. Spero, and C. B. Nicholson to *President* for course.

The following have been appointed Admiralty Surgeons and Agents: Weston-super-Mare, Mr. E. R. Clutterbuck; Coventry, Surg. Lt. Comdr. W. P. Elford, R.N.V.R.; Newquay, Mr. D. R. Mitchell; Enfield Lock, Mr. H. P. Warren; Guernsey, C.I., Surg. Lt. Comdr. B. S. Collings, R.N. (retired); Emsworth, Hants, Surg. Capt. H. P. Turnbull, R.N. (retired); and Haslemere, Mr. C. W. Jenner.

ROYAL NAVAL VOLUNTEER RESERVE

Proby, Surg. Sub-Lt. R. R. Prever promoted to Proby, Surg. Lt.

ROYAL ARMY MEDICAL CORPS

Temp. Commissions.—The undermentioned to be Lts.: C. W. Maisey, Maj. G. M. Lewis, from R.A.M.C. (T.A.),

and relinquishes the rank of Maj., H. Ferguson, A. T. Marrable, R. J. G. Morrison, and F. T. Moore.

REGULAR ARMY RESERVE OF OFFICERS

The undermentioned having attained the age limit of liability to recall cease to belong to the Res. of Off.: Lt. Cols. W. J. E. Bell, D.S.O., F. T. Dowling, and G. R. Painton, and Maj. T. W. O. Sexton.

TERRITORIAL ARMY

Capt. R. Lodge resigns his commn.

Capt. A. J. Will to be Maj.

V. H. Sarland (late Lt., I.M.S.) to be Capt.

K. M. Morris (late Offr. Cadet, Edinburgh Univ. Contgt. (Med. Unit), Sen. Div., O.T.C.) to be Lt.

ROYAL AIR FORCE

Flight Lt. F. E. Lipscomb to R.A.F. Station, Northolt.

INDIAN MEDICAL SERVICE

Maj. J. E. Ainsley to be Lt.-Col.

Military Cross.—Temp. Capt. Patit Paban Chowdry, M.B., B.S., late I.M.S., for distinguished services rendered in the field in connexion with the Loe-Agra Operations, N.-W. Frontier of India, Feb. 23rd to April 13th, 1935.

The names of the following have been brought to notice by the Commander-in-Chief in India, for distinguished services rendered in connexion with the operations:—

I.M.S.: Maj. A. H. Craig, M.B., Ch.B., No. 3 Field Ambulance; T/Capt. P. P. Chowdry, M.B., B.S.; T/Capt. S. P. Bhatia, M.B., B.S., M.R.C.S.

INDIAN HOSPITAL CORPS: No. 1/A/3451 Naik Guahar Singh, No. 3 Field Ambulance.

The undermentioned officers have vacated appts. in India:—

D.D.M.S.—Maj.-Gen. J. F. Martin, C.B., C.M.G., C.B.E., K.H.S., Brit. Serv.

A.D.M.S.—Maj.-Gen. A. W. M. Harvey, K.H.S., I.M.S.

D.A.D.H.—Maj. J. W. F. Albuquerque, I.M.S.

The undermentioned appts. have been made in India:—
D.D.M.S.—Maj.-Gen. A. W. M. Harvey, K.H.S., I.M.S.

Maj.-Gen. G. A. D. Harvey, C.M.G., Brit. Serv.

COLONIAL MEDICAL SERVICE

Dr. W. Barnetson has been appointed Medical Officer, Uganda, and Dr. G. L. Timms, Medical Officer, Kenya.

DEATHS IN THE SERVICES

The death occurred on Feb. 17th at Plymouth of Lieut.-Col. THOMAS HERBERT CORKERY, R.A.M.C. ret'd. He was born at Poona in 1861, and qualified in 1884 with the Scottish double diploma. He joined the Army as a surgeon in January, 1886, accompanied the expedition to Manipur in 1891, receiving a medal with clasp. He also served in Burma 1891-92, and with the expedition to Kachin Hills, for which he received a clasp. On retiring from the active list in 1906 with the rank of lieut.-colonel he was employed at Exeter until 1911, and three years later was recalled to service during the European war.

THE American Academy of Arts and Sciences announces that the first award of the Francis Amory septennial prize, which is offered for contributions of "extraordinary or exceptional merit" to our knowledge of the diseases of the human generative organs, will be made in 1940 if work of sufficient merit is put forward. The total amount of the prize will exceed ten thousand dollars, and it may be given in one or more awards. There will be no formal nominations and no essay or treatise will be required; but the committee invites suggestions, and these should be sent to the Academy at 28, Newbury-street, Boston, U.S.A.

CORRESPONDENCE

MEDIASTINOTOMY FOR SURGICAL EMPHYSEMA

To the Editor of THE LANCET

SIR,—Generalised surgical emphysema may or may not be a clinical rarity when associated with pulmonary tuberculosis, as in the case reported in your current issue. It may, however, be a fatal condition when it complicates either disease or injury. The fact that such cases may be saved by the early performance of the (almost minor) operation of suprasternal (collar) mediastinotomy does not, strangely enough, seem to be generally appreciated, even amongst surgeons. A simple incision, immediately above the sternum, down to and through the deep fascia, allows the air, often pent up under considerable tension, to escape freely. The operation may be done with the patient in bed, and, if not withheld too long, the way in which a hitherto generalised emphysema will subside within a few hours can only be described as dramatic.

I am, Sir, yours faithfully,

GEORGE A. MASON.

Newcastle-upon-Tyne, Feb. 17th.

CHILD BORN WITH A FOREIGN BODY IN THE HEART

To the Editor of THE LANCET

SIR,—Drs. Eaton and Corbet, having found at autopsy a small metallic foreign body in the right ventricle of a new-born child's heart, suggest with assurance that the object must have been within the uterus at the time of conception, and that the embryo "grew around it." Although gold and silver intra-uterine contraceptives may fail in their purpose and appear as neonatal decorations, it is difficult to see how this particular foreign body, which was 3 by 2 mm., came to be lying free within the right ventricle of what we take to be an otherwise normal heart, if we have to rely on your correspondents' suggestion that the embryo must have virtually wrapped itself around the object. The heart is already well developed though tubular after 26 days or so, at which time the whole embryo would only be of the size of the foreign body! One cannot imagine inclusion of such a body and the subsequent development of anything like a normal foetus. Surely a more reasonable explanation is that the object, lying within the uterus, was involved between true and capsular decidua and thus came to be incorporated in the blood sinuses of the placenta, whence it became dislodged, probably during the commotion of labour, and passed via umbilical vein to the right heart.

I am, Sir, yours faithfully,

Guy's Hospital, S.E., Feb. 17th.

J. R. AUDY.

TRANSMISSION OF RELAPSING FEVER BY TICKS IN PALESTINE

To the Editor of THE LANCET

SIR,—It has been suspected since the late war that there is a relapsing fever in Palestine transmitted by ticks. The fowl tick, *Argas persicus*, which is widely disseminated in Palestine, has been wrongly suspected. Recent investigation of a small outbreak of relapsing fever in Kfar Vitkin, south of Hedera in the coastal plain, showed that all infections could be traced to a cave infested with *Ornithodoros papillipes*.

Ticks collected in the cave readily transmitted spirochaetes to rats in the laboratory. This tick produces a local analgesia while biting and there is therefore no reaction (scratching) on the part of the victim. Coxal fluid and faeces are not excreted during feeding. Transmission is therefore obviously by bite, and contamination plays no part. The entry of spirochaetes into the skin from the proboscis of infected ticks was demonstrated experimentally. Three infected ticks (adults) were fed on a human being during an intermission between two relapses; immediately after feeding the puncture wounds were examined and spirochaetes demonstrated in smears stained with Giemsa. A similar experiment performed on a clean rat gave an identical result; spirochaetes were easily demonstrated in the smears and the rat subsequently became infected.

We are, Sir, yours faithfully,

S. ADLER, O. THEODOR,
H. SCHIEBER.

Department of Parasitology, the Hebrew University,
Jerusalem, Jan. 29th.

PURIFICATION OF THE HEMOPOIETIC FACTOR

To the Editor of THE LANCET

SIR,—In your annotation last week there is a slight misunderstanding as to the "maximally effective dose" of Dakin and West's liver fraction. A single dose which is effective for the production of maximal reticulocyte responses is not necessarily sufficient to produce an increase of red blood-cells at a maximum rate over periods of from 10 to 20 days or more. It is therefore incorrect to compare the single doses of 80–150 mg., which in Dakin and West's series usually produced maximal reticulocyte responses, with the average amount (359 mg.) which, given in divided doses to 11 of our cases, was followed by a certain average rate of red blood-cell increase in 40 days, since, in the former series, data regarding the red blood-cell increases following the reticulocyte crises are not available. A comparison of reticulocyte responses following single doses of material is given in Table II. of our paper, and the conclusion is that for the production of maximal reticulocyte responses single doses in excess of 100–200 mg. are usually required.—We are, Sir, yours faithfully,

C. C. UNGLEY, E. J. WAYNE,
L. S. P. DAVIDSON.

Newcastle-upon-Tyne, Feb. 14th.

HOSPITALS AND THE RATES

To the Editor of THE LANCET

SIR,—My attention has been drawn to a serious inaccuracy in a statement on the rating of hospitals made to our last court of governors. In a comment upon the wide variation in assessments throughout the country the Newcastle hospitals were cited as among those either not rated or subsidised by municipal authorities. This is not the case. My board regret that this unfortunate slip has caused trouble to the management of the Royal Victoria Infirmary, and would be grateful if you would publish this correction.

I am, Sir, yours faithfully,

S. R. C. PLIMSOLL,

Secretary-Superintendent, The Middlesex Hospital, W.1.
Feb. 18th.

STAMMERING NOT A SPEECH DEFECT

Miss KATE EMIL-BEHNKE writes: "I have read with great interest the annotation on this subject in your issue of Jan. 25th (p. 208). If the dictum 'Define your Terms' had been acted upon in the past in the consideration of stammering the fatal error would not have been made of regarding it as a defect of speech. By 'defect' is generally understood a permanent disability, which in its application to speech indicates an ever-present inability to articulate some letter correctly, such as lisping, whereas there is no letter that a stammerer cannot at times enunciate perfectly. Curiously enough, this very variability in its incidence has contributed to the misconception as to the true nature of the trouble, leading to two assumptions both of which prevent treatment being undertaken in the early stages, when it can be speedily and permanently overcome. One assumption is that the trouble will be outgrown, a view which is encouraged by the fact that as stammerers grow older they become adroit at evading words which present a difficulty and substituting others. The second assumption is that the stammer is due to carelessness, the latter idea being very naturally fostered by there being many occasions on which no stammering is present.

"Undoubtedly stammering is in essence a neuro-pathic condition, and suitable treatment should be applied directly there is any sign of it, when it will yield to psychic handling combined with 'relaxing' and quiet deep breathing exercises. If the trouble is not attended to derangement of the entire musculature of respiration, phonation, and articulation follows, leading not only to the establishment of the 'fear' complex but to wrong muscle action, both of which can, later, only be conquered at the cost of considerable expense, time, and patience. The resultant derangement is so great and so obvious that it has led to the serious error of adopting *elocutionary* treatment which is not only useless, but in the majority of cases makes the trouble far worse by focusing the stammerer's attention on symptoms and not on the cause.

"It was formerly held that it was useless to attempt treatment before the age of ten. Present-day knowledge enables it to be applied as early as three or four years of age—in other words, when the trouble first appears."

THE GRINSTEAD SERPENT

"ALBUS" writes: "Objections have been made to the symbol of the serpent surmounting the Grinstead Hospital, as it has been held to be the symbol of evil. It is true that the serpent is introduced into the story of the Fall as the symbol of evil united with wisdom, because it was under this form that he beguiled Eve. Revelation xii. 9, states: 'And the great dragon was cast down, the old serpent, he that is called the Devil and Satan, the deceiver of the whole world.' Serpents were early recognised to be dangerous and the idea arose to escape evil by propitiating the power that was behind it; hence serpent worship, a form of superstition widely spread. Good qualities were then attributed to the object of worship, especially the power of healing; this may have determined the display of a brazen serpent as the means of curing the snake-bitten Israelites. Large snakes were usually kept in the shrines of Æsculapius and appear sometimes to have been regarded as the God himself; patients in the shrines had visions in which some action is taken by snakes or dogs. The snakes thus seen in dreams were connected with healing and not evil.

"Superstition has clustered round snakes. The snake has been regarded as a symbol of hygiene

because he shed his skin so frequently while renewing his health. The snake is also a symbol of eternal life in the form of a living ring when the snake has his tail in his mouth. In Hindu mythology, said Monier-Williams, the Sanskrit scholar, a curious race of serpents, half human, half divine, called Nagas, is supposed to exist in the regions under the earth.

"The caduceus is a subject of controversy. It has been used as a medical emblem in, for example, the French military corps, our own R.A.M.C., and the arms of Dr. Caius, the second founder of Gonville and Caius College. The usual emblem employed is a staff around which two serpents are interlaced, though one serpent only is occasionally present as in the R.A.M.C. emblem. The medical connexion of course is that the device is accepted as the sign manual of Æsculapius, although the original emblem of Æsculapius was a club with one serpent coiled round it, symbolising the snake's power of renewal. The staff with two serpents coiled round it was not connected with medicine originally. It was the device borne by the messengers of the gods, especially Mercury; in its original form the staff was surmounted with a knot of ribbons for which later two intertwined snakes were substituted. As however no existing activities are represented by the action of the messengers of the Gods in conducting souls to the world below, the staff, now with intertwined serpents, has come to stand for the art of medicine. The application of the term caduceus or wand of Mercury to the staff and serpent of Epidaurus which symbolises Æsculapius is therefore erroneous. There is a more commonplace and humorous interpretation of the rod with its interlaced snakes; it has been held to signify concord between merchants in competition; the serpent has always symbolised astuteness, eloquence, and seductiveness, qualities in keeping with this commercial interpretation of the caduceus." A fine large example of the wand can be seen on the new metal outer door of the Bank of England.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED
FEB. 8TH, 1936

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2270; diphtheria, 1370; enteric fever, 23; acute pneumonia (primary or influenzal), 1472; puerperal fever, 44; puerperal pyrexia, 132; cerebrospinal fever, 17; acute poliomyelitis, 2; acute poliomyelitis, 1; encephalitis lethargica, 6; dysentery, 32; ophthalmia neonatorum, 82. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Feb. 14th was 4257, which included: Scarlet fever, 1012; diphtheria, 1094; measles, 816; whooping-cough, 697; puerperal fever, 19 mothers (plus 14 babies); encephalitis lethargica, 283; poliomyelitis, 3. At St. Margaret's Hospital there were 20 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 54 (5) from measles, 7 (0) from scarlet fever, 28 (10) from whooping-cough, 39 (4) from diphtheria, 45 (24) from diarrhoea and enteritis under two years, and 85 (11) from influenza. The figures in parentheses are those for London itself.

The mortality from influenza is on the wane, the total deaths for the last ten weeks, working backwards, being 85, 98, 104, 89, 110, 110, 80, 67, 62, 45. The deaths this week are scattered over 44 great towns, Bristol reporting 5, Manchester and Birmingham each 4, Halifax, Liverpool, St. Helens, Sheffield, and Stoke-on-Trent each 3, no other great town more than 2. Manchester had 10 deaths from measles, Liverpool 7, Salford and Bristol each 4. Whooping-cough caused 5 deaths at Birmingham. Deaths from diphtheria were reported from 25 great towns, 4 from Hull, 3 from Newcastle-on-Tyne, 2 each from Wood Green, Reading, Middlesbrough, St. Helens, Salford, Wakefield, and Swansea.

The number of stillbirths notified during the week was 272 (corresponding to a rate of 40 per 1000 total births), including 38 in London.

OBITUARY

**SIR CHARLES BALLANCE, K.C.M.G., C.B.,
M.S. Lond., F.R.C.S. Eng.**

CONSULTING SURGEON, ST. THOMAS'S HOSPITAL

THE death occurred, as we announced last week, on Saturday, Feb. 8th, of Sir Charles Ballance, the distinguished surgeon and neurologist, consulting surgeon to St. Thomas's Hospital. He had been in delicate health for some time, though his final illness was not a long one.

Charles Alfred Ballance was the eldest son of the late Charles Ballance, of Stanley House, Clapton. The father died in 1873 leaving four sons and four daughters, the eldest son being only 17 at the time. The family had lived in Taunton previous to migration to London, and Charles Ballance went to Taunton College and for a period on the continent for his early education before entering St. Thomas's Hospital as a student. It is an interesting fact that the three younger brothers followed their senior's example in the choice of a profession, the surviving one being Sir Hamilton Ballance.

Ballance entered St. Thomas's Hospital in 1876 and was from the first a distinguished student. He took the English diplomas in 1879, and in 1881 graduated as M.B. Lond. with first-class honours in each subject, and B.S. as gold medallist. In the following year he obtained the diploma of F.R.C.S. Eng. and the degree of M.S., when he was again gold medallist. At St. Thomas's he filled a series of resident posts, becoming later surgical registrar to the hospital and demonstrator of anatomy. He spent the time of waiting in anatomical and bacteriological research in London and in Leipzig, where he attended the first bacteriological course opened in the university, a veteran experience to which he would often allude. His first staff appointment at St. Thomas's came promptly—it was that of assistant aural surgeon, and in the same year he was elected assistant surgeon to the West London Hospital. He was also appointed examiner in elementary anatomy at the Royal College of Surgeons of England where he delivered in 1889 the Erasmus Wilson Lecture on the ligation of arteries. This lecture indicated the direction which Ballance's first original researches had taken, and in our columns last week Sir Charles Sherrington described graphically the intensity with which Ballance and Walter Edmunds worked out their valuable and practical conclusions. These researches were followed up by the eager quest with S. G. Shattock for parasitic protozoa, hoping thus to

determine the aetiology of malignant disease. As is known, despite the elaborate pains and time expended, no conclusive results were reached.

But Ballance became known to the surgical world as a coming man, and to this position he was aided by his writings. He contributed to Heath's "Dictionary of Surgery" the article on meningocele and encephalocele, and that on injuries and diseases of the scalp; in the *Transactions* of the Pathological Society he wrote, in association with Shattock, on the intimate pathology of cancer; to the *Journal of Physiology* he contributed in collaboration with Sherrington a paper on the genesis of scar tissue; while other papers, all the result of personal investigation, appeared in the *Transactions* of the Medical Society,

of the Clinical Society, and frequently in the *St. Thomas's Hospital Reports*. The Erasmus Wilson Lecture became the foundation of a book written in collaboration with Edmunds, who was the first medical superintendent of St. Thomas's Home—an excellent surgeon and a keen experimental investigator. The joint work proved that the results up to that day of operations upon great arteries were unsatisfactory, the danger of secondary hæmorrhage being a pressing one, and the authors set out to show how such failures came about and how they could be avoided. An elaborate series of experiments continued over six years was detailed in the treatise. Ballance wrote also soundly on various directions of aural practice in Allbutt's "System of Medicine" and in the *St. Thomas's Hospital Reports*, and in the *Transactions* of the Medical Society of London and those of the Medico-Chirurgical Society. In 1891 Ballance was appointed surgeon to the National Hospital for Paralysis and Epilepsy where he worked with Victor Horsley with whom he had previously been associated at the Browne Institute during Horsley's superintendency. His claims to the appointment were strong.

Ballance's experiments on nerve-suture and nerve-grafting were elaborate. On this work he was engaged for many years, in collaboration with Sir James Purves-Stewart, the publication of the results being however delayed by Ballance's absence at the South African war. They appeared at last in 1902 in an illustrated quarto volume in which the experiments were fully described, the process of degeneration in the peripheral nerve after injury and of regeneration in a divided nerve being carefully set out, while a good historical résumé and bibliography were appended. The experimental work was



SIR CHARLES BALLANCE

(Photograph by Elliott & Fry)

afterwards explained by the authors at a meeting of the Royal Medico-Chirurgical Society, where in the discussion which took place Sherrington, Mott, Rickman Godlee, and other experts debated at length the conclusions of the authors, which were found to be of high practical value.

In a large number of public deliveries Ballance throughout his career informed his hearers of neurological progress and of the methods employed by himself and those with whom he worked. Such an address was delivered at Brighton in 1907 when he gave a vivid account of his personal experiences in cranial surgery. Comparing the indications for opening the abdomen with those for opening the skull, he pointed out that the diagnosis of intracranial disease is the far more complex problem, while exploratory operation cannot be conducted with the same rapidity and completeness. Thus he found the maxim that diagnosis should precede operation to be true *only* of those diseases where the signs, symptoms, and course can be fully comprehended; where danger will attend delay provisional diagnosis must be acted upon, while the most eminent neurologists will occasionally differ as to the localisation of a brain tumour. He recorded cases where intracranial intervention had been called for by the obvious conditions found, and paid a tribute to the value of X ray photography at the stage which it had reached 30 years ago. The address was a good example of the speaker's power, frequently displayed, of dealing with large subjects clearly and succinctly, a faculty which he kept throughout his life—instances, the Lister Memorial Lecture, the MacEwen Memorial Lecture delivered in 1930 at Glasgow where the university conferred upon him the LL.D. degree, and the address on the progress of surgery delivered in 1906, as president of the Medical Society of London.

Ballance's contributions to medical literature, if published in volume form, would have shown him a prolific author, but although he might have constructed many books by compilation, only two stand to his individual name—viz., "Points in the Surgery of the Brain and Membranes," and "Essays on the Surgery of the Temporal Bone." The latter, published in 1919, was a massive production, for the subject was dealt with in two large volumes, while the format and illustrations compelled its issue at a very high price. The valuable display of plates offered a possible substitute for study in the museum and post-mortem room, while the text was erudite, the result of ripe experience and high literary capacity. The volumes traversed the history of the surgery of the temporal bone and described in detail the intracranial complications of the pathology of the region. The book was written as a plea for the better recognition of the importance of aural surgery and the provision of additional beds for aural patients.

Ballance had important and intimate relations with the Royal College of Surgeons of England. The Erasmus Wilson Lecture he delivered shortly after he obtained the Fellowship, while early in his career he was appointed an examiner in anatomy. And at this end of his life he was working at the laboratories of the College at Down with undiminished interest in neurological research. He was elected to the council of the College in 1910, was a member of the court of examiners for ten years, and of the council for 16 years, becoming in 1920 vice-president of the College. In 1919 he delivered the Bradshaw Lecture upon surgery of the heart (THE

LANCET, i., 1, 73, and 134), in 1921 the Thomas Vicary Lecture on the history of surgery of the brain (THE LANCET, 1922, i., 111, 165), and in 1933 delivered the Lister Memorial Lecture, in which he showed that his early investigation into the cause of malignant disease was still vivid in his mind. In the address he described the work done with Shattock on the appearance of incubated carcinomatous cells, to which Sir Charles Sherrington referred last week, and on this occasion the Lister medal was conferred on him for his distinguished contributions to surgical science, an honour shared with his friends Harvey Cushing and Watson Cheyne.

Ballance had worked with Cushing on more than one occasion in America; latterly he spent a long period in the States where full opportunities for experimental work were afforded him, and where his position as a neurologist stood very high. Unfortunately this visit coincided with the sudden and acute dislocation of financial affairs in the United States, and although Ballance worked with his usual thoroughness, his physiological experiments were necessarily impeded for want of material.

Ballance was the first president of the Society of British Neurological Surgeons. "He founded the society," says Mr. Geoffrey Jefferson, "but characteristically refused to hold office for more than one year, insisting on relinquishing office for Mr. Wilfrid Trotter. The society replied by making him honorary president." Mr. Jefferson also writes in admiration of Ballance's enthusiasm maintained to the end of his life for the fields of investigation which he had cultivated. "He was," he says, "a regular attendant at meetings, and at the age of 77 he journeyed to Edinburgh and Aberdeen to show his films of experimental nerve anastomosis; and later to Manchester. He belonged to an age in neuro-surgery which is past, and his chief value in discussion was his reminiscence of famous happenings of bygone days. Nevertheless his comments on current trends and events were always most trenchant, and though he admired the past his wits were definitely in the present. He endeared himself to us all by his friendliness, his encouragement, and the genial banter of his conversation." Prof. Archibald Young writes in similar vein of "the generous readiness and enthusiasm with which Ballance received new work by a junior colleague. In the deliberations of the Society of British Neurological Surgeons his searching but kindly criticism was always welcomed. In spite of advancing years he remained very much the young man, and in his latest years did some of his most remarkable work on nerve anastomosis and regeneration."

Ballance had a distinguished war record. He was called up on the outbreak of hostilities with the rank of colonel, A.M.S., and did valuable service in the Mediterranean during the war years, stationed in Malta. He was several times mentioned in dispatches, and in 1916 was made C.B. (Mil.). The University of Malta gave him a medical degree. In 1918 he was made K.C.M.G.

We have here a picture of a singularly consistent career. Ballance vowed himself to surgery almost as a boy, and never deviated from the obligations. In the ward and in the operating room, as in the laboratory, he was single-hearted in his search for the truth. He was a man of wide reading, as would appear from the quotations in his numerous addresses, but in everything that he wrote he kept the same unswerving path, the same determination to advance medical knowledge by the records of experiment and observation.

Sir Charles Ballance married in 1883 Sophia Annie, daughter of the late Alfred Smart, of Blackheath, who died ten years ago. They had one son and several daughters, but the son, Dr. Alaric Ballance, to his father's intense grief, died quite young in 1932.

ADOLPH BRONNER, M.D. Heidelb., M.R.C.S. Eng.

THE death occurred on Feb. 7th at the age of 75 of Dr. Adolph Bronner, well known as ophthalmologist and laryngologist. He was a profuse contributor both to English and foreign journals on his specialties, and his work at Bradford earned him a wide reputation.

Adolph Bronner was born in 1860 the younger son of the late Dr. Edward Bronner, who founded, in coöperation with the late Dr. John Bell, and with the financial assistance of Sir Jacob Behrens, the Bradford Royal Eye and Ear Hospital. He was educated at Bradford High School and Bradford Grammar School, receiving his medical training at the universities of London, Heidelberg, Freiburg, and Berlin. He graduated at Heidelberg as M.D. in 1884 and in the following year took the diploma of M.R.C.S. The early direction of his studies was indicated by an appointment at the Royal London Ophthalmic Hospital and by an M.D. thesis on sympathetic ophthalmia. Appointed surgeon to the Bradford Eye and Ear Hospital in 1886 in succession to his father, he later became laryngologist at the Bradford Royal Infirmary. His contributions to the *Transactions* of the Ophthalmological Society covered a large range of subjects, while other papers which attracted attention will be found in the *Archives of Otolaryngology* (New York) and in the *Transactions* of the International Medical Congress at Rome of 1894 where he acted as secretary to the laryngological section, and in those of the international meetings of otologists held at Paris in 1889, Berlin in 1890, and London in 1899. To the *British Medical Journal* and to these columns he also contributed many sound and interesting clinical papers, giving always practical information.

Bronner was deservedly held in high esteem by his Bradford colleagues and was at one time president of the Bradford Medico-Chirurgical Society and at another president of the Leeds Medico-Chirurgical Society. At the time of his death he was consulting surgeon both to the Bradford Royal Eye and Ear Hospital and consulting laryngologist to the Bradford Royal Infirmary.

Prof. F. W. Eurich writes: "Dr. Adolph Bronner had retired only 13 years before his death but so great had been the changes in the professional life of Bradford that there are now not a few to whom he has been little more than a name. There will however be many former patients who remember him as their benefactor and friend and they will be widely scattered for they came not from the West Riding only but from the Yorkshire dales and neighbouring counties. After the death of his father Dr. Edward Bronner, his elder brother took the family practice, leaving Adolph Bronner to devote himself to diseases of the eye, ear, and throat. He built upon foundations laid by his father but soon made a great name for himself both among his colleagues and the public. It could not have been otherwise for he combined with deep knowledge and with great skill as an operator a cheeriness and a kindness of heart which won him the affection of all. Even in the thronged life of hospital practice he was never brusque. He would care for more than the

special trouble for which his advice was sought, and many a sovereign and even now and then a five-pound note would be passed surreptitiously to some needy patient. When he retired from hospital practice a tablet commemorating his great services was placed beneath that dedicated to the memory of his father in the entrance-hall of the Bradford Eye and Ear Hospital. A year or two later he left Bradford to enjoy his hobbies—golf and fishing, but, a bachelor, he never settled anywhere, coming back at last to die in the city he had served so well."

ALFRED SAMUEL GUBB, M.D. Paris, D.P.H.

WE regret to learn the death of Dr. Alfred Gubb, who 50 years ago was very well known to many of his London colleagues; for the last 30 years he practised on the continent, mainly in Algeria.

Alfred Gubb was born at Abingdon in 1857, the son of Edwin John Gubb, a lecturer in science. He received his medical education at the Westminster Hospital, where he was Bird prizeman and a medallist, and later at the University of Paris, where he graduated in medicine in 1885. He was appointed resident obstetric assistant to the Westminster Hospital and then for a year was resident medical officer at the French Hospital in London. He had a considerable continental connexion, held a post as medical adviser to the Belgian Consulate and for some time was English correspondent of *La Semaine Médicale*. From 1898 to 1903 he was editor of the *Medical Press and Circular*, with which journal he maintained his connexion until quite recently as a translator of articles from the French. To *The Lancet* he made occasional contributions, either in connexion with materia medica or with obstetric medicine. These subjects furnished him with the material for a useful little book "Aids to Gynæcology" and qualified him to edit Griffith's "Materia Medica and Pharmacy." More than 30 years ago Gubb decided to practise abroad and at first spent half the year in Aix-les-Bains and the remainder in Algeria. From Algeria he made from time to time interesting communications on the climate, flora, and natural features of the country. Some of those he put together into pamphlets or albums, as he elected to call them, because of their profuse illustrations, and he maintained for a period a close association with British practitioners wishing to send patients abroad. He died on Feb. 3rd at Mustapha Supérieur, Algiers.

ETHEL MILLER VERNON, M.D. Lond.

THERE died on Jan. 19th Dr. Ethel Vernon, a prominent woman practitioner who had been in general practice in Westminster for over 30 years. She was the eldest daughter of Thomas Heygate Vernon. Three members of the family entered the medical profession, the others being Dr. Horace Vernon, a well-known authority on hygiene, and Mr. Arthur Heygate Vernon, a skilful and successful surgeon at Bournemouth, whose death occurred last year.

Ethel Vernon was one of the earliest women to qualify through the London School of Medicine for Women, obtaining the L.S.A. in 1897 and four years later graduating as M.D. Lond., at that date an unusual distinction. At the London School of Medicine for Women she was demonstrator of physiology, while she acted as house surgeon and house physician at the New Hospital for Women and as assistant anaesthetist at the Royal Free Hospital.

She then went into private practice, midwifery occupying most of her time at the commencement. In this capacity she became the adviser and in many cases the personal friend of a large number of her patients, her success as family counsellor being due not only to clinical accomplishment, but to close understanding of the domestic problems which arise in households where the daily cares weigh heavily on the mother. She carried her sympathy to a high level of personal responsibility, denying herself to assist the sick mother or child and often placing her seaside home at their disposal. For over 20 years she worked hard for the promotion of child welfare, was medical adviser to the Borough-road Infant Welfare Centre, the Sutton Nursery School, and Highgate School for Girls, while since 1919 she had been medical officer to two Westminster welfare centres. She shortened her life by her devotion to her work. A woman of unusually robust constitution and physique, she remained at work throughout the recent severe cold period and succumbed unexpectedly to an attack of pneumonia. The memorial service held at St. Martin-in-the-Fields proved by the large congregation of mourners the esteem and affection in which she was widely held.

RICHARD VERNON FAVELL, M.R.C.S. Eng.

Dr. Richard Favell, who died on Feb. 4th aged 55, was a student at St. Bartholomew's Hospital, where he took the double English diploma in 1906 and held the appointments of house surgeon and resident midwifery assistant. He was also president of the Abernethian Society. He was a member of a well-known Sheffield family and at the beginning of his professional career practised in partnership with his father, Dr. Richard Favell, senior. He continued in practice at Sheffield for a time and acted as anaesthetist to the Sheffield Royal Infirmary, but retired some 12 years ago to Cornwall, living at St. Buryan, where his death occurred. In Cornwall he held many public offices, while he was a keen educationist and an accomplished archæologist and horticulturist. He had been High Sheriff for the county where he was a considerable landowner, and was an F.S.A. Scotland.

HUGH MILLER GALT, M.B. Glasg.

WE regret to announce the death on Feb. 14th, at his home in Jersey, of Dr. Hugh Galt. Born at Kilmarnock and educated at Kilmarnock Academy, he entered the University of Glasgow as a medical student, graduating as M.B., C.M. with honours in 1891 and being also a prizeman. He was for a time house surgeon and house physician at the Western Infirmary, Glasgow, and then went into the service of the P. and O. Company. Later he acted for a time as dispensary physician at the Infirmary, obtained the D.P.H. in 1896, and that of F.R.F.P.S. Glasg. in 1898. He was appointed professor of forensic medicine and lecturer in hygiene at St. Mungo's College, Glasgow, and was for a period dean of the medical faculty, and pathologist and lecturer on hygiene at the Glasgow Royal Infirmary. His services as examiner were frequently in demand, for he acted in this capacity both in medical jurisprudence and in hygiene for the Scottish Conjoint Board, and in medical jurisprudence for the Royal Faculties of Glasgow. Some 25 years ago Galt left Glasgow and going to Brighton was appointed pathologist to the Stephen Ralli memorial laboratory at the Royal Sussex County Hospital. He took an

active part in the Brighton and Sussex scheme for the prevention of venereal disease, while his services as an expert witness were often in demand. During the war he was attached with the rank of captain, R.A.M.C., to the 2nd Eastern General Hospital, Brighton.

Galt, who was for a period Crown medico-legal examiner for Glasgow and Lanarkshire, had made during his career as a jurispudent an enormous number of post-mortem examinations and given medical evidence in several sensational trials. He retired from practice two years ago.

RICHARD JOHN MORRIS, C.B.E., M.D. Durh., M.R.C.P. Lond.

THE death occurred at Harrogate on Jan. 23rd of Dr. R. J. Morris, after a long and painful illness bravely borne.

Richard John Morris was born at Rosscarbery, Co. Cork, and received his education at the Diocesan School, Rosscarbery, and Queen's College, Cork. After graduating as L.S.A. in 1884 he settled in practice at Lancaster. Here he joined the Volunteer Battalion of the King's Own Royal Lancaster Regiment from which he retired in 1910 with the rank of Major. An excellent rifle shot, he captained the Irish International Twenty Team at Bisley from 1896-1900. After his marriage in 1895 he entered St. Bartholomew's Hospital and qualified as M.R.C.S., L.R.C.P. in 1900, subsequently taking the M.D. Durh. and M.R.C.P. Lond. He studied at Bordeaux under Prof. Bergonié, and then settled in Harrogate as a spa physician. In 1915 he was appointed to the Northern Command Depot at Ripon with the rank of Lieut.-Colonel. For his services he was made Commander of the Order of the British Empire. At the end of the war he had a severe illness from which he never entirely recovered; but in spite of ill-health he continued with his practice, and during this period was successively chairman of the Harrogate division of the British Medical Association and president of the Harrogate Medical Society.

Dr. Morris was a good sportsman and a good friend; he will be much missed by those who knew him best. He leaves a widow for whom sympathy will be felt. There are no children.

LLOYD MIDDLETON BOWEN-JONES, M.R.C.S. Eng., D.P.H.

THE death occurred on Feb. 2nd of Dr. Lloyd Bowen-Jones, of Carmarthen, who was well known in his district, having been medical officer of health for the borough for 33 years and of the Carmarthen rural district for a still longer period. The son of the Rev. Richard Bowen-Jones, J.P., he received his medical education at Guy's Hospital, where he was for a time resident obstetric physician. He acted as house physician at the Seamen's Hospital before returning to his native Wales to practise. There he held other local appointments in addition to those mentioned, and was in particular a pioneer in the fight against tuberculosis. He was personally responsible for large subscriptions to the erection of the West Wales Sanatorium, and when the institution was taken over by the Welsh National Memorial Association he became chairman of the house committee, while a ward opened at the sanatorium was named after him. Dr. Bowen-Jones was 83 years of age at the time of his death.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

School Home Work and Children's Health

THE House of Commons on Feb. 12th agreed without a division to a motion by Mr. Radford that it is undesirable for school-children to have their evenings occupied with home work to the exclusion of rest and recreation, and that, whenever practicable, preparation on the school premises should be substituted for home work. Among many striking examples of abuse of home work he cited the testimony of a vicar whose choir boys attended a grammar school where so much home work was given that the boys had to work on Sundays in order to be ready for Monday. It was, he thought, extraordinary that such a state of affairs should be tolerated for children of tender years by a nation so solicitous of their welfare when they were a little older.—Sir Ernest Graham-Little, in supporting the motion, said it was a reproach to a teacher if the child was required to do much home work; teachers were, however, handicapped by the size of their classes.—Mr. G. A. Morrison was more anxious for girls than boys in view of Sir Henry Hadow's observation that if one gave a girl too much to do she broke down but if one gave a boy too much to do he did not do it.—Mr. Potts, while agreeing that home work might be useful, thought there was a reasonable limit beyond which if they overworked children's brains they were doing more harm than good.—Mr. Lees-Smith said the reason for overpressure, the curse of secondary education, was the school certificate examination, schools being judged by the number of their matriculation successes.—Mr. Oliver Stanley, in a sympathetic reply, said the Board of Education was actually in the middle of a comprehensive inquiry into the whole question of school home work. The Government were determined to see that whatever was wrong was remedied.

Extension of Milk Subsidy Scheme

In the House of Commons on Feb. 17th the financial resolution in connexion with the Milk (Extension of Temporary Provisions) Bill was considered in Committee.

Mr. RAMSBOTHAM, Parliamentary Secretary to the Ministry of Agriculture, in moving the resolution recalled the circumstances of crisis in which the original Act was passed in 1934. He said that the milk marketing scheme then inaugurated was particularly welcome to the Board of Education because that Department had for some time been contemplating an intensive drive in the direction of more extended physical education and training for children, which would also necessitate greater attention to the health of the children so trained. It was obvious that they could not neglect the provision of better facilities for diet and nourishment for those to be trained. For that reason, the action taken under the Milk Act of 1934 to provide cheap milk for children was one of the best actions ever taken by any Government. The scheme was still in its experimental stage and there was need in many directions for further investigation. Even if it were possible at the moment to embark on a long-term policy it would still be advisable to operate the milk-in-schools scheme on an experimental basis to remove various difficulties before placing it on the permanent basis on which he trusted it would one day be placed. By the spring of 1935 the number of children in public elementary schools taking milk had increased to about 2,500,000. If they added the children in grant-aided schools the number to-day was in the neighbourhood of 2,750,000 and the consumption was just on 23,000,000 gallons. There were still, however, about 2,800,000 scholars who were not

drinking milk in schools, that was more than 60 per cent. of the school population.

The Government to-day were faced with three alternatives. First, that the provisions of the Act of 1934 should be allowed to lapse. That would be deplorable. Secondly, they might retain the milk-in-schools scheme and terminate the assistance given to manufacturing milk, devoting the amount of that assistance to providing further cheap milk for children. That would severely shake the price structure of the industry, by leaving an immense gallonage on the manufacturing market. The Government were therefore left with the third alternative, which he recommended to the Committee. It was that they should continue their action along the lines of the 1934 Milk Act and extend those provisions in accordance with this financial resolution.

CRITICISM OF GOVERNMENT POLICY

Mr. T. JOHNSTON said he could not understand, when Mr. Ramsbotham said there must be a further investigation, what there was to investigate. The facts were beyond dispute. Men like Sir John Orr had committed themselves to the statements that we could increase the height of our school-children by 3 in. and increase their weight by 4 to 6 lb., and the Leighton-McKinlay experiment in Lanarkshire, though covering only a period of four months, seemed to justify to the full the statements made by Sir John Orr and the other experts who had made this subject their own. We were facing now, in winter time, 27 per cent. of an alleged milk surplus, but the Government did not know what to do with it. They were providing considerable sums of money to convey the surplus into dried milk, condensed milk, and other uses. It was a remarkable fact that in a land where at least 10 per cent. of our people lived below the British Medical Association's standard of nutrition, we raised money to destroy an absolutely essential food.

There was a need for supplying liquid milk to the consumers of this country.

As a result of prolonged study nutrition experts had discovered, particularly in the Newcastle area, that 47 per cent. of the children of the poor were below standard weight, that 23 per cent. were anemic, and 36 per cent. were unhealthy and unfit. The last report, for 1932, showed that 52 per cent. of the recruits applying for admission to the British Army failed on physical grounds, and that of the 48 per cent. who got through 36.9 per cent. were subsequently rejected on medical grounds. A League of Nations committee of experts reported on the Physiological Bases of Nutrition, and said that there should be at least one litre of milk a day for expectant and nursing mothers, as well as an abundant supply for infant children of all ages and adolescents. The practice of providing milk, either free or at a reduced price, was highly recommended. The Orr-Lloyd investigations showed that 10 per cent. of our people were not spending 4s. per head on food, yet the British Medical Association's figure was 5s. 10½d. per week as a minimum. There were at least another 20 per cent. just on the borderline of the Association's minimum standard.

The hospitals, infirmaries, clinics, and poor-law institutions were in a terrible plight, and the Government were busily engaged in organising a policy of increasing the cost of milk to voluntary hospitals, infirmaries, and clinics. At the Royal Hospital for Sick Children in Glasgow the Government's milk policy raised the cost of milk to these poor sick children by £500 a year. The cost to the Royal Infirmary had gone up by £1500. The jump in the figure for the hospitals of the Lanarkshire county council was £800, and for the Glasgow town council hospitals, £12,300. There was something inherently wrong in that. He recognised that it was not a practicable proposal at the moment to ask that milk

should be supplied free to the hospitals and institutions, but surely the Minister could make it imperative that the price to be charged for milk should be the pre-Milk Order price, that at which they were getting milk before the Marketing Boards started to raise prices. Then the hospitals and clinics would use more milk.

After further debate,

REPLY BY THE MINISTER OF AGRICULTURE

Mr. ELLIOT said that 2,750,000 children were getting milk to-day who would not have been getting milk if these proposals had been defeated two years ago. Not only that, but they were getting milk at half the price at which they were getting it then, and another great army besides. What was more, the cheapening of the milk to the local authorities had meant the doubling of those who were getting milk entirely free. They had to do two things—to maintain the milk industry and the production of milk and also to secure so far as they could the health and upbuilding of the future generation. No greater injury could be done to either than to try to fuse the two. If they advanced the cause of health in the schools on the ground of merely finding a receptacle for the surplus of milk, or anything else, they would defeat their own objects. He welcomed the criticism which had been made about the defects in the milk-in-schools scheme and he was asking the Committee for a further extension of time in order to investigate them. This period of test—not of experiment—of administrative experience would be most valuable when they came, as they would within a few months, to the framing of the long-term policy in this section of agriculture. Refuting the suggestion that milk was being destroyed for food purposes the right hon. gentleman said that not a penny of Government money had been spent on any milk that was going to any other process than the processing of milk for food. As to the improvement of the quality of the milk-supply steps had been taken by the Government and the Milk Marketing Board to improve the quality by making a levy on all producers and giving a bonus of a penny a gallon on all milk which came up to the standard of Grade A; and in a relatively short space of time they had brought 27 per cent. or more of the milk up to Grade A standard. That was a far greater improvement in the quality and the cleaning up of the milk than had been obtained in any comparable time by any other administrative measure. When the statement was made that the Government should here and now adopt some ad hoc method for children, and more particularly for adults, in ensuring the consumption of milk, he thought that the Committee would be well advised to consider well before embarking on that step. He had heard suggestions that cards should be sold by the Ministry of Labour to the unemployed whereby they could buy more milk. That seemed to him to be coming terribly close to the issue of ration cards. There was a grave danger of segregation of the classes in some of these proposals.

Mr. JOHNSTON: Will the right hon. gentleman say a word or two about the position of the hospitals and infirmaries and the increase that they have been compelled to pay

Mr. ELLIOT said that while he had the utmost sympathy with the desire of those institutions to get their milk-supplies at a lower rate, he was afraid that he could not concede the main point that if they got them at a lower rate they would purchase more. As far as the hospitals were concerned it was exactly that case that he had tried to make again and again and he had been defeated by the obvious answer that the hospitals would buy as much as was necessary for the needs of their patients, but that no amount of cheap milk would alter the figures. Certainly if any scheme could be worked out he would support it forthwith. If not, then he was afraid they could not solve the question under this method; they must wait for the long-term measure.

The resolution was carried by 213 votes to 140.

Committee on Child Adoption

In answer to a question put to him in the House of Commons on Feb. 13th, whether he had considered the representations made to him in regard to the alleged existence of abuse in connexion with the adoption of children, Sir JOHN SIMON said he had appointed a committee to inquire into the matter consisting of Miss Florence Horsbrugh, M.P. (chairman), Mr. Benjamin Edward Astbury, Mr. John Henry Harris, Mr. J. J. Mallon, LL.D., J.P., Mr. Brian Manning, F.C.A., J.P., Mrs. Montagu Norman, and Mr. Geoffrey W. Russell, with Mr. J. A. R. Pimlott of the Home Office (secretary). The committee would inquire into the methods pursued by adoption societies or other agencies engaged in arranging for the adoption of children and report whether any, and, if so, what measures should be taken in the public interest to supervise or control their activities.

HOUSE OF COMMONS

WEDNESDAY, FEB. 12TH

British Red Cross Units in Abyssinia

Mr. MANDER asked the Secretary of State for Foreign Affairs if he had information as to how many British subjects were serving Red Cross units in Abyssinia; what attacks had been made on these units by the Italian air force; and whether any undertaking had been asked for or obtained from the Italian Government that no further attacks would be made on Red Cross units.—Mr. EDEN replied: According to such information as is available, I understand that 19 British subjects are serving in the British Red Cross hospital and other ambulance units, foreign and national, in Ethiopia. This figure does not include native dressers, transport drivers, and other junior non-European personnel recruited in Kenya or British Somaliland, for service with these units. As regards the second part of the question, I would refer the hon. Member to the reply I gave on Feb. 10th. As regards the last part, the Italian Government have been officially notified, through H.M. Embassy in Rome, of the sphere of action of the British Red Cross unit now operating with the Ethiopian forces on the northern front.

Interpretation of Poisons Rules

Sir ERNEST GRAHAM-LITTLE asked the Home Secretary whether he would, in view of the variety of interpretations given to it, state what was the precise meaning to be attached to the word manufacture as used in Rule 29 of the Poisons Board Rules issued in December, 1935; and whether that word covered the processes of compounding and dispensing medicines containing poisons and used for the treatment of internal human ailments.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: Rule 29 of the Poisons Rules has been made under Section 23 (1) (i) of the Pharmacy and Poisons Act, 1933, which gives power for rules to be made "for requiring persons in control of the manufacture of pharmaceutical preparations containing poisons to be registered pharmacists or persons possessing the prescribed qualifications in chemistry." It seems to me clear that the word "manufacture," both in the Act and in the Rule, denotes only the operations carried on in factories by manufacturers, and does not cover such operations as the compounding and dispensing of their own medicines by medical practitioners.

THURSDAY, FEB. 13TH

Writing of Medical Prescriptions

Lieut.-Colonel MOORE asked the Home Secretary whether, in view of the recent disclosures at coroners' proceedings that doctors wrote prescriptions so illegibly that in many cases the address and signature were indecipherable and of the serious developments to which such practices were giving rise, especially in the issue of drugs, he would consider taking action to ensure that prescriptions should not be dispensed unless easily legible.—Sir JOHN SIMON replied: I have no information that would lead me to suppose that the practice referred to is prevalent or has been productive of any harm to the

public. There are, as the hon. Member will be aware, various legal requirements in regard to the dispensing of poisons and dangerous drugs which seem to provide such safeguards as may be necessary.

Amidopyrin Scheduled as a Poison

Mr. HALL-CARNE asked the Home Secretary whether his attention had been called to the increase of deaths by poisoning due to pyramidon; and whether steps were to be taken to ensure that this would be classed as a poison at the earliest opportunity.—Sir JOHN SIMON replied: Yes, Sir. Under the new Poisons List and Rules which are to come into operation on May 1st next, this drug (which is more correctly described as amidopyrin) will be scheduled as a poison and its sale to the public will be unlawful except on medical prescription.

Tuberculosis (Attested Herds) Scheme

Mr. WILFRID ROBERTS asked the Minister of Agriculture how many herds in England and Wales have now been attested under the Tuberculosis (Attested Herds) Scheme; how many of these herds were previously licensed as Grade A (T.T.) or certified herds; and what the total costs had been to date in administration and in the payment of the premium of 1d. per gallon.—Mr. ELLIOT replied: Sixty-five herds have been attested in England and Wales under the Tuberculosis (Attested Herds) Scheme. Of these, 22 are herds licensed to produce Grade A (T.T.) and Certified milk. The total cost of administering the scheme to date, including £1485 in respect of the expenses incurred in a course of training of the Ministry's inspectors in the uniform application of the tuberculin test and £1430 in experimental investigations for improving and perfecting the technique and material used in the application of the test, is £9600. A further sum of £715 has been paid in respect of the premium of 1d. a gallon for milk sold from attested herds through the Milk Marketing Scheme.

Anæsthetics in Municipal and Voluntary Hospitals

Mr. EDWARD DUNN asked the Minister of Health if there were any statistics available which showed the difference in the mortality-rate where gas-and-oxygen was used as the anæsthetic as against the use of chloroform and ether in municipal and voluntary hospitals.—Sir KINGSLEY WOOD replied: I am not aware that any statistics of this character are available. Certain information in regard to deaths during or connected with the administration of anæsthetics of all kinds is contained in the Text Volume of the Registrar-General's Statistical Review for the year 1933.

Ambulance Service at Enfield

Mr. BULL asked the Minister of Health under what circumstances the ambulances of local authorities were permitted to be used for the conveyance of sick persons not suffering from any infectious disease, as well as for cases of acute surgical and medical emergency; whether his attention had been called to the absence of such permission in the case of the Enfield ambulance service; and whether this matter could be reviewed.—Sir KINGSLEY WOOD replied: A local authority which has provided an ambulance for the conveyance of persons suffering from infectious disease has power to use it for the conveyance of other sick persons with suitable precautions. In Enfield the power of providing ambulances for infectious disease vests in the joint hospital board and not in the urban district council, and I understand that the council are actively considering means of getting over this difficulty. The Departmental Committee on the Consolidation of the Law relating to Local Government and Public Health have considered the question of the provision of ambulances by local authorities and have recommended a simplification of the law.

Vaccine Lymph from Rabbits

Mr. LEACH asked the Minister of Health whether rabbits were still used in the Government lymph establishment in connexion with the production of calf lymph, notwithstanding the opinion of certain vaccination experts that the use of rabbits was probably the cause of the cases of post-vaccinal encephalitis which had followed the use of such lymph in recent years.—Sir KINGSLEY WOOD replied: Yes, Sir. I am advised that there is no valid evidence to suggest that the use of rabbits in the preparation of

lymph has any influence on the occurrence of post-vaccinal encephalitis.

Mr. GROVES asked the Minister of Health whether rabbits were still used in the Government lymph establishment in connexion with the production of the supplies of calf lymph issued to public vaccinators; and what measures were adopted to secure that the rabbits so used were not suffering from spontaneous encephalitis.—Sir KINGSLEY WOOD replied: The answer to the first part of the question is in the affirmative. As regards the second part, the rabbits are born and reared on the premises and are used at the age of three to four months. There is, therefore, ample opportunity for observing their condition. Further, as I am advised, there is no affinity between the encephalitis of rabbits and post-vaccinal encephalitis.

Clothing and Footwear for Necessitous Children

Mr. ELLIS SMITH asked the President of the Board of Education if it was the intention of the Government to institute legislation which would enable education authorities to provide clothing and footwear for necessitous school-children.—Mr. OLIVER STANLEY replied: The whole question of the provision of clothing and footwear for necessitous children was raised by a deputation from the Association of Education Committees which I received on Jan. 16th, and I am at present considering it.

MONDAY, FEB. 17TH

Disabled Soldiers and Hospital Allowances

Mr. DAVID DAVIES asked the Minister of Pensions (1) the amount of allowances at present paid to disabled soldiers attending hospitals for treatment due to disabilities caused by the Great War, distinguishing the cases of men who were forced to leave their employment and the cases of men who were unemployed, and (2) the number of ex-Service men who attended hospitals under the Ministry during 1936 for treatment, who had not received any treatment allowances, and whose wives and dependants, in consequence of the failure of the Ministry to provide allowances, had been compelled to seek poor-law relief.—Mr. R. S. HUDSON replied: In the case of men who are normally in employment before admission and who suffer loss of wages or profits on account of admission to hospital, allowances are payable in accordance with the terms of the Royal Warrant. In the case of men who were unemployed before admission but were in receipt of either unemployment benefit or allowances from the Unemployment Assistance Board before admission to hospital, supplementary grants are payable in accordance with the announcement which I made in the House on Oct. 22nd last, which substantially meet the loss of income suffered by their families. The object of this, as I stated at the time, was to obviate the necessity of their families having to have recourse to the poor-law solely on account of the man's admission to a Ministry Hospital. Although I have no statistics which would enable me to answer the hon. member's second question, I am satisfied that in general my object has been achieved.

Milk Production and Consumption

Sir FRANCIS ACLAND asked the Minister of Agriculture the total milk production for England and Wales for each of the last four calendar years; and the estimated amounts consumed as liquid milk and used in factories for milk products.

Mr. THOMAS WILLIAMS asked the Minister of Agriculture the quantities of milk sold for liquid consumption by the Milk Marketing Board and producer retailers; and the quantities sold for manufacturing purposes during the years 1934 and 1935.—Mr. ELLIOT replied: The estimated total production of milk in England and Wales in the four years 1931/32-1934/35 is as follows:—

Years (June to May)	Million gallons
1931/32	1·303
1932/33	1·349
1933/34	1·379
1934/35	1·399

The foregoing figures represent the total amount of liquid milk estimated to have been available for all purposes

other than for feeding to stock, and are based on the information obtained through the voluntary census of 1930/31, assuming that the average lactation yield has not changed since that date. The information at my disposal is not sufficient to enable me to say how much of the total production was consumed as liquid milk and how much was used in factories for milk products. The following particulars of milk sold for liquid consumption and for manufacture by the Milk Marketing Board have been supplied by the Board.

	Year ended.	
	Sept. 30th, 1934.	Sept. 30th, 1935.
Sold for liquid consumption—	Gals.	Gals.
(a) Under wholesale contracts ..	523,813,326	554,174,376
(b) By producer-retailers ..	109,970,885	104,932,128
—	633,784,211	659,106,504
Sold for manufacture	192,623,561	301,829,328

Milk Prices and Public Demand

Mr. ACLAND asked the Minister of Agriculture whether any experiments analogous to the Bishop Auckland potato experiment had been made to ascertain the effect of differential milk prices on the public demand for milk; if so, what were the results; and, if not, whether any such experiments were in contemplation.—Mr. ELLIOT replied: No experiment to ascertain the effect of differential prices on the public demand for milk has, so far as I am aware, been made on the lines of that conducted by the Potato Marketing Board at Bishop Auckland. The Milk Marketing Board for England and Wales prepared a scheme for the supply of milk at special prices to unemployed in the Merthyr Tydfil district, one object of which was to ascertain the effect of reduced prices on demand, but it was not found possible to introduce the scheme. Other schemes are still under consideration, but I cannot at present say whether it will be possible to proceed with them.

Supply of Milk in Schools

Miss RATHBONE asked the Minister of Agriculture what had been the amount of the Exchequer grant actually paid during the last 12 months, or other ascertainable period, towards the supply of milk in schools and, secondly, towards the cost of milk supplied to manufacturers for milk products; and what had been the average price per gallon received by the farmers in both cases.—Mr. ELLIOT replied: During the first 12 months (Oct. 1st, 1934, to Sept. 30th, 1935) of the operation of the Milk-in-Schools Scheme in England and Wales, 22½ million gallons of milk were consumed in respect of which the Milk Marketing Board received £401,000 in grants from the Exchequer, an average rate of 4'23d. per gallon. During the same 12 months (Oct. 1st, 1934, to Sept. 30th, 1935) (for which information is not yet complete) 200 million gallons of milk were processed in England and Wales in respect of which the Milk Marketing Board received £1,061,000 by way of Exchequer advances, an average rate of 1'27d. per gallon. Individual producers actually received in respect of both supplies the Pool Price which has averaged throughout the 12 months in question 11'99d. per gallon.

Mr. WILFRID ROBERTS asked the Minister of Agriculture the average number of children that had obtained milk daily under the Milk-in-School Scheme in each quarter since the passing of the Milk Act, 1934, and what the cost had been to the Exchequer.—Mr. ELLIOT replied: Precise figures showing the average number of children that have obtained milk daily under the Milk-in-Schools Scheme in each quarter since the passing of the Milk Act, 1934, are not available, but at the end of March, 1935, the number of children receiving milk under the scheme, free or for payment, in grant-earning schools in England and Wales was about 2½ million. At the beginning of October, 1935, the corresponding figure was about 2½ million. Exchequer grants amounting to £447,495 have so far been paid to the Milk Marketing Board for England and Wales

in respect of milk supplied during the period Oct. 1st, 1934, to Oct. 31st, 1935. For similar information relating to Scotland, I would refer my hon. friend to my right. hon. friend the Secretary of State for Scotland.

Mr. THOMAS WILLIAMS asked the President of the Board of Education if he would give the figures for the latest dates available of the number of school-children who received a free supply of milk and the number who received milk at schools at the reduced price, and the total annual consumption of each category.—Mr. OLIVER STANLEY replied: The number of school-children receiving free milk in all types of grant-earning schools in England and Wales was about 300,000 on Oct. 1st, 1935, the latest date for which figures are available. The number who received milk at school at that date at the reduced price under the Milk-in-Schools Scheme was about 2½ millions. The annual consumption by the children who pay for milk is about 22,500,000 gallons. The annual consumption by the children who receive free milk cannot be accurately estimated, as these children receive varying amounts of milk, but it is probably about 4 million gallons.

Miss RATHBONE asked the President of the Board of Education what would be the cost of supplying a free ration of one-third of a pint of milk every school day to every child in elementary schools, and upon what number of children and price of milk was the estimate based; and what would be the additional cost if the provision were extended to week days when schools did not meet.—Mr. OLIVER STANLEY replied: There are about 5,300,000 children attending public elementary schools in England and Wales. To supply this number with one-third of a pint of milk daily for 200 school days about 44 million gallons of milk would be required. Including week-days when the schools do not meet about 69 million gallons would be required. I am not in a position to give an estimate of the cost to public funds which would be involved if this quantity of milk were supplied free, as the price per gallon could only be determined after negotiations with the milk industry.

The Attested Herds Scheme

Mr. ACLAND asked the Minister of Agriculture whether he could give, to the most recent convenient date, figures showing the number of producers of milk entitled to receive the bonus for pure milk provided by the Milk Act of 1934; what was the output of such producers; and what improvement the figures showed over the corresponding figures at any earlier date.—Mr. ELLIOT replied: The number of producers of milk from herds certified by the Ministry under the Attested Herds Scheme to date is 59, who own a total of 65 herds, comprising 2558 animals which have been attested at various dates since Feb. 1st, 1935. Twenty-two of the herds are licensed to produce Certified or Grade A (T.T.) milk, and in cases in which the owners have claimed exemption in respect of such milk from the Milk Marketing Scheme, they are not entitled to receive the bonus under the Attested Herds Scheme. The only figures indicating output are contained in the claims for the 1d. per gallon bonus payable in respect of milk sold through the Marketing Scheme. Claims have been received in respect of 40 herds only, covering an average of about five months each, and a total production of 237,076 gallons. There are no corresponding figures in respect of any previous period.

Elimination of Bovine Tuberculosis

Mr. ACLAND asked the Minister of Agriculture what sums the Government had spent since 1934 on experiments to discover means of eliminating bovine tuberculosis; and whether any results had been achieved.—Mr. ELLIOT replied: Research on bovine tuberculosis has been in progress for some years at the Institute of Animal Pathology, Cambridge, and, to some extent, at the Ministry's Veterinary Laboratory, and the National Institute for Research in Dairying at Reading. It is not possible to give a precise figure of the sums expended, which form part of the general expenditure of the institutions named. Since 1934, however, in consultation with the Agricultural Research Council, special grants have been made to extend the work at Cambridge, amounting to £375 in the year ended March 31st, 1935, and £5320 in the year ending March 31st next. The subjects of the investigation are

the use of BCG vaccine and of tuberculin and the work is still in progress.

Scarlet Fever and Destruction of School Books

Mr. ANDERSON asked the President of the Board of Education if his attention had been called to the burning of school books in the Pinxton district of North Derbyshire owing to an epidemic of scarlet fever; and if the method stated was universal; and, if so, what was the cost during the past 12 months in renewal of books and the department or authority responsible for the cost.—Mr. OLIVER STANLEY replied: I have no information regarding the burning of school books in the Pinxton district, but I am making inquiries. I understand that it is not the universal practice to destroy school books after an epidemic, but the question in a particular case is one to be decided by the local education authority on the advice of the Medical Officer of Health. I have no information as to the cost involved in the renewal of books destroyed in this way during the past 12 months, but any such expenditure by a local education authority would receive grant from the Board.

TUESDAY, FEB. 18TH

Stone-dusting Regulations in Mines

Mr. DAVID DAVIES asked the Secretary for Mines the number of samples of coal dust taken by the inspector of mines, under the stone-dusting regulations, in 1935; giving the number that did not comply with the requirements provided in the regulations and stating the volatile content of the coal seams in the cases where the samples

taken were not in accordance with the stone-dusting regulations.—Captain CROOKSHANK replied: The number of mine road dust samples taken by inspectors of mines in 1935, under the regulations relating to precautions against coal dust, was about 6500, of which 520 did not comply with the requirements of the regulations. I regret that the information asked for in the last part of the question is not available.

Research on Diseases of Animals

Sir ARNOLD WILSON asked the Lord President of the Council whether, in view of the fact that apart from members of the veterinary profession serving on the committees dealing with diseases of animals there was no representative of the profession on the Agricultural Research Council, he would consider strengthening the Agricultural Research Council by the addition of representatives of the veterinary profession.—Mr. RAMSAY MACDONALD replied: It is not considered desirable that professions as such should be represented on the Agricultural Research Council. The Committee of the Privy Council for the Organisation and Development of Agricultural Research decided, however, at a recent meeting that the representation on the Agricultural Research Council of the sciences underlying the study of animal health should be strengthened. They therefore approved the appointment of Mr. John Smith, O.B.E., M.R.C.V.S., D.V.H., formerly Director of Animal Health in Northern Rhodesia, and since 1933 a member of the Colonial Advisory Council of Agriculture and Animal Health, as a member of the Agricultural Research Council.

MEDICAL NEWS

University of Cambridge

At recent examinations the following candidates were successful:—

D.M.R.E.

*R. E. Alderson, Sylvia D. Bray, G. Q. Chance, W. J. Craig, I. T. Dickson, Isaac Eban, N. G. Gadekar, V. R. Ginde, Mary C. Leishman, R. B. Mehta, A. N. Nanda, L. D. Pringle, A. M. Rackow, A. I. Silverman, A. C. Sinclair, Edith H. Smith, Florence L. Telfer, *William Tennent, and D. A. Wilson.

* Distinction.

Royal College of Surgeons of England

A meeting of the council of the College was held on Feb. 13th with Sir Cuthbert Wallace, the president, in the chair. It was decided that the Hunterian dinner which could not be held this year should take place on Feb. 15th, 1937. The Hallett prize for December, 1935, was presented to Robert Sutherland Lawson of the University of Melbourne.

The offer by the *British Journal of Surgery* of 1000 guineas to be expended in research work in surgery was accepted, and the council gave permission for the erection in the College of a tablet to record the services of Lord Moynihan to surgery and the journal. It was reported that Prof. Einar Key, of Stockholm, had accepted the honorary fellowship of the College, and that he would attend the meeting of the council on June 11th to be admitted. Mr. R. E. Kelly was reappointed as the representative of the College on the court of the University of Liverpool for three years, and Sir Holburt Waring was appointed representative of the College at the congress of the Universities of the Empire to be held in Cambridge in July.

The council passed a vote of condolence on the death of Sir Charles Ballance, a past vice-president of the College.

The posts of resident surgical officer and first house surgeon at the Croydon General Hospital were approved for recognition for the six months' surgical practice required of candidates for the final fellowship examination.

Diplomas of fellowship were granted to Theodor Anton Green and Josephus Corbus Luke, and diplomas of membership to S. Alankaram and to the candidates given in our issue of Feb. 8th (p. 339). Diplomas in public health, medical radiology, and anaesthetics were granted jointly with the Royal College of Physicians to the candidates mentioned in the same issue (p. 340).

University of Wales

Three research scholarships in the University of Wales will be awarded in the session 1936-37. Particulars will be found in our advertisement columns.

University of Sheffield

Prof. J. H. Dible has been appointed external examiner in pathology and bacteriology, Prof. E. J. Wayne representative of the university on the National Council for Domestic Studies, and Prof. G. L. Roberts on the Dental Education Advisory Committee.

British College of Obstetricians and Gynaecologists

At a recent meeting of the council the following were promoted to the fellowship of the college:—

Jack Roland Stanley Grose Beard (Adelaide), Alexander Ernest Chisholm (Dundee), John Francis Cunningham (Dublin), Constance Elizabeth D'Arcy (Sydney), Ernest Chalmers Fahmy (Edinburgh), Margaret Fairlie (Dundee), John Gardner (Glasgow), Robert Lance Impcy (Cape Town), Robert Aim Lennie (Glasgow), Hilda Nora Lloyd (Birmingham), Rupert Eric Magarey (Adelaide), John Chassar Moir (London), and William Foster Rawson (Bradford).

Royal College of Surgeons in Ireland

The Charter Day dinner was held last Saturday in the hall of the college, with Mr. Seton Pringle, the president, in the chair. There was an attendance of nearly 120, the guests including the Lord Mayor of Dublin (Mr. Alfred Byrne), the American Minister to the Irish Free State (the Honourable Alvin Owsley), and the Vice-Chancellor of Queen's University, Belfast (Mr. F. W. Ogilvie). In his speech the president spoke of the danger of too many students seeking admission to the medical profession with the resulting possibility of overcrowding. He suggested that the medical schools should raise the standard of general education required for entrance, and he quoted examples of the low degree of education exhibited by some candidates. Prof. T. G. Moorhead, who replied for the guests, spoke of the union recently effected between the Irish Medical Association and the Irish Free State branches of the British Medical Association, and asked for support of the union from all members of the profession. He also spoke of the prospects of establishing a Medical Research Council, to be financed from sweepstake funds. He said that the profession would not bring into being any council that had not full control over the moneys that were granted for medical research, nor any council with merely advisory functions.

Dr. C. P. Martin, professor of anatomy at Trinity College, Dublin, has been appointed to the chair of anatomy at McGill University, Montreal.

Dr. Douglas Lee, late Sharpey scholar in the physiology department at University College, London, has been appointed to the chair of physiology at the Singapore Medical College.

Royal Sanitary Institute

At a meeting on housing to be held at this institute (90, Buckingham Palace-road, London, S.W.), on Tuesday, March 10th, at 5.30 P.M., Sir Raymond Unwin will open a discussion on planned distribution as a means of preventing crowding. Lord Balfour of Burleigh, the president, will take the chair.

Bilton Pollard Fellowship

An award of this fellowship, which has an annual value of £650, will shortly be made to a man student who has held a resident appointment at University College Hospital where the fellowship is tenable. Candidates must be members of the Royal College of Physicians of London or fellows of the Royal College of Surgeons of England, and must intend to practise in medicine or surgery. Full particulars may be had from the secretary of the hospital, Gower-street, London, W.C.1, and applications for the fellowship must be made before March 2nd.

London Inter-Collegiate Scholarships Board

This board announces that an examination for twelve medical scholarships and exhibitions, of an aggregate total value of £1418, will begin on May 11th. They are tenable at University College and University College Hospital medical school, King's College and King's College Hospital medical school, the London (Royal Free Hospital) School of Medicine for Women, the London Hospital medical college, and St. George's Hospital medical school. Full particulars and entry forms may be obtained from the secretary of the board at King's College Hospital medical school, Denmark Hill, S.E. 5.

Course on Mental Deficiency

A course of lectures on mental deficiency and allied conditions has been arranged for medical practitioners by the extension and tutorial classes council of the University of London in co-operation with the Central Association for Mental Welfare. The course, which will be supplemented by clinical instruction, is divided into two parts (mental deficiency, April 20th to 25th; retarded and difficult children, April 27th to May 2nd), and these may be taken separately. Applications should reach Miss Evelyn Fox, University Extension Department, University of London, South Kensington, S.W.7, by March 30th.

The Food Education Society

Three lectures will be given by Maj.-General Sir Robert McCarrison at the London School of Hygiene and Tropical Medicine, Keppel-street, W.C., on consecutive Thursdays at 5 P.M. on nutrition and health (March 12th); food in relation to the structure and functions of the body (March 19th); and nutrition and national health (March 26th).

A lecture on winter salads will be given by Mrs. Jenny Fliess at the Soho School of Cookery, 20, Soho-square, London, on Thursday, March 5th, at 3.30 P.M. Tickets may be obtained from the Food Education Society, 29, Gordon-square, W.C.1.

Tuberculosis Conference

The tenth conference of the International Union against Tuberculosis will meet in Lisbon from Sept. 7th to 10th under the chairmanship of Prof. Lopo de Carvalho, who will open the discussion on radiological aspects of the hilum of the lung and their interpretation. Dr. Olaf Scheel (Norway) is speaking on primary tuberculous infection in the adolescent and the adult, and Dr. C. J. Hatfield (United States) and Dr. D. A. Powell (Great Britain) on the open case of tuberculosis in relation to family and domestic associates. Other speakers will include Dr. W. T. Munro and Dr. L. S. T. Burrell. Further information may be had from the National Association for the Prevention of Tuberculosis, Tavistock House North, Tavistock-square, London, W.C.1.

THE untimely death at the age of 37 of Dr. Erroll Williams, of Southport, aroused general sympathy in the neighbourhood, for he had only been married a short time and had made a good impression on the public and his colleagues during his residence in the town. He served in the Royal Flying Corps during the war and gained the Distinguished Flying Cross.

The Minister of Pensions has appointed Dr. Michael Abdy Collins, O.B.E., to the post of Mental Inspector to the Ministry.

Taunton and Somerset Hospital

An appeal for £35,000 is being made to build additional wards and modernise this hospital.

New Casual Wards at Enfield House

The Middlesex county council have provisionally agreed to erect new casual wards at Enfield House to take the place of those in use at Edmonton House and also to build at Chase Farm, Enfield, two additional blocks for able-bodied inmates from Enfield House and Edmonton House.

Ramsbottom Cottage Hospital

Lieut.-Colonel Porritt and his wife have offered to pay the building costs of extensions at this hospital which include a new children's ward and a new operating theatre.

Bovey Tracey Hospital

A new children's ward was opened at this hospital on Feb. 5th to commemorate King George's jubilee.

Salford Royal Hospital

The out-patient department at this hospital, which was opened in 1911, is to be completely transformed as it is inadequate for present-day needs. The massage department, at present housed in a hut in the hospital yard, is to have a new building and the provision of a nurses' recreation room is under consideration.

Maternity and Child Welfare Conference

A national conference on maternity and child welfare will be held at the Picton Hall, Liverpool, on July 1st, 2nd, and 3rd under the presidency of Mr. Geoffrey Shakespeare, parliamentary secretary to the Ministry of Health. The subjects for discussion will include maternal welfare and the public; antenatal nutrition; the education of parents through day nurseries and nursery schools; parents and substitute parents; the importance of co-operation between maternity and child welfare services and the specialist health services; and rest and convalescence as factors in maternal welfare. The conference is being organised by the National Council for Maternity and Child Welfare and by the National Association for the Prevention of Infant Mortality. The maternity and child welfare group of the Society of Medical Officers of Health is also co-operating in the conference, and will afterwards hold a clinical meeting for medical practitioners on July 4th. The secretary of the conference is Miss Halford, Carnegie House, 117, Piccadilly, London, W. 1.

Fellowship of Medicine and Post-Graduate Medical Association

An advanced course in thoracic surgery will be given at the Brompton Hospital from Feb. 24th to 29th, and M.R.C.P. evening courses will be held as follows: chest and heart diseases at the Royal Chest Hospital (March 16th to April 4th); chest diseases at the Brompton Hospital (March 8th to April 4th); clinical and pathological demonstrations at the National Temperance Hospital (Feb. 25th to March 12th). An all-day course in orthopaedics has been arranged at the Royal National Orthopaedic Hospital (March 9th to 21st), and an afternoon course in neurology and psychopathology at the West End Hospital for Nervous Diseases (March 2nd to 27th). Week-end courses are to be held as follows: chest diseases at the Brompton Hospital (March 7th and 8th); clinical surgery at the Royal Albert Dock Hospital (March 14th and 15th); medicine at the Miller General Hospital (March 21st and 22nd); and urology at the All Saints Hospital (March 28th and 29th). Detailed syllabuses of all courses may be had from the secretary of the fellowship, 1, Wimpole-street, W. 1.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

- ROYAL SOCIETY OF MEDICINE**, 1, Wimpole-street, W.
MONDAY, Feb. 24th.
Odonology. 8 P.M. Mr. A. W. Wellings: Three Dental Abnormalities. Dr. C. F. Cosin: Aberrations of Calcium Metabolism in relation to Dental Disease.
TUESDAY.
Medicine. 5 P.M. Dr. G. W. Pickering: Obliterative Arterial Disease as it affects the Limbs. Prof. J. Paterson Ross and Prof. H. M. Turnbull will also speak.
Pathology. 8.15 P.M. for 8.30 P.M. Prof. J. W. McLeod: Data Bearing on Significance of *B. diphtheriae* Types accumulated in the last four years.
WEDNESDAY.
Comparative Medicine. 5 P.M. Prof. J. G. Wright: The Use of the Non-volatile Narcotics. Dr. Douglas Beifrage, Mr. B. Balfour-Jones, and Mr. Basil Hughes will also speak.
THURSDAY.
United Services: Psychiatry. 4.30 P.M. Colonel J. Healy-Spencer and Dr. E. Mapother: Functional Nervous Disease in the Fighting Services.
Urology. 8.30 P.M. Mr. R. H. O. B. Robinson: Horse-shoe Kidney. Mr. T. J. Millin: Impotence and its Surgical Treatment, with reference to New Operative Procedure. Mr. A. Elliot-Smith: Steinach II. Operation for Enlarged Prostate.
FRIDAY.
Disease in Children. 4.30 P.M. (Cases at 4 P.M.) Dr. Bernard Myers: 1. Essential Purpura Hemorrhagica. Dr. M. Price (for Mr. D. Levi): 2. Osteochondrodystrophy of Marqouie Type. Dr. R. C. Jewesbury: 3. Jaundice and Hepatic Cirrhosis. 4. Bilateral Foramina of the Parietal Bones. Dr. A. G. Maitland-Jones: 5. Tay-Sachs Disease. Dr. David Nabarro: 6 and 7. Congenital Syphilis showing Cutaneous Gummatous Lesions. Dr. W. P. H. Sheldon: 8. Anaemia with Bone Changes. Dr. Donald Bateman (for Dr. D. Paterson): 9-11. Epiphyseal Dysplasia Punctularis.
Epidemiology and State Medicine. 8.30 P.M. Sir William Hamer: The Endemic Influenza Prevalence of 1933-35.
Physical Medicine. 8.30 P.M. Mr. Francis Talbot and Mr. H. Mandivall: The Amelioration of Dental Sepsis by Physical Methods including Ultra-violet Irradiation and Ionisation.
MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.
MONDAY, Feb. 24th.—8.30 P.M., Lord Horder: Etiology and Treatment of *Bacillus coli* Infections of the Urinary Tract.
WEDNESDAY.—9 P.M., Dr. P. H. Manson-Bahr: The Differential Diagnosis of Diseases of the Colon (Dysentery and Colitis) and their Complications. (Second Lettsomian lecture.)
HUNTERIAN SOCIETY.
MONDAY, Feb. 24th.—9 P.M. (Mansion House, E.C.), Sir Lenthal Cheate: John Hunter's Time and Ours. (Hunterian oration.)
MEDICO-LEGAL SOCIETY.
THURSDAY, Feb. 27th.—8.30 P.M. (Mansion House, 26, Portland-place, W.), Mr. H. N. Linstead: Statutory Safeguards against Poisoning—the Work of the Poisons Board.
BRITISH PSYCHOLOGICAL SOCIETY.
WEDNESDAY, Feb. 26th.—8.30 P.M. (Institute of Medical Psychology, Malet-place, W.C.), Miss Margaret Ash-down: The Role of the Psychiatric Social Worker. Dr. W. J. T. Kimber and Dr. William Moodie will also speak. (Medical section.)
ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.
WEDNESDAY, Feb. 26th.—2.30 P.M. (11, Chandos-street, W.), Dr. E. Guttman: Experimental Psychoses induced by Mescaline.
ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY, Lisle-street, W.C.
WEDNESDAY, Feb. 26th.—4.15 P.M., Clinical Meeting. 5 P.M., Dr. F. A. E. Silcock: The Lady with the Green Hair and other Interesting Skin Cases.
LECTURES, ADDRESSES, DEMONSTRATIONS, &c.
ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.
THURSDAY, Feb. 27th.—5 P.M., Dr. E. L. Middleton: Industrial Pulmonary Disease due to the Inhalation of Dust, with Special Reference to Silicosis. (First Milroy lecture.)
UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL, W.C.
FRIDAY, Feb. 28th.—5 P.M., Dr. Cecil Price-Jones: The Sizes of Red Blood Cells. (Sydney Ringer lecture.)
NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.
TUESDAY, Feb. 25th.—5.30 P.M., Dr. D. Evan Bedford: Radiological Examination of the Heart and Great Vessels.

- HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL**, N.W.
WEDNESDAY, Feb. 26th.—4 P.M., Dr. C. Rickword Lane: Clinical Pathology in General Practice.
HOSPITAL FOR EPILEPSY AND PARALYSIS, Maida Vale, W.
THURSDAY, Feb. 27th.—3 P.M., Dr. Anthony Feiling: Demonstration.
NATIONAL HOSPITAL, Queen-square.
MONDAY, Feb. 24th.—2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Critchley: Cerebral Vascular Disease.
TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Critchley: Cerebral Vascular Disease.
WEDNESDAY.—2 P.M., Dr. Martin: Out-patient Clinic. 3.30 P.M., Dr. Kinnier Wilson: Clinical Demonstration.
THURSDAY.—2 P.M., Dr. Symonds: Out-patient Clinic. 3.30 P.M., Mr. Leslie Paton: Optic Neuritis.
FRIDAY.—2 P.M., Dr. Critchley: Out-patient Clinic. 3.30 P.M., Dr. Purdon Martin: Other Infectious Diseases of Nervous System.
HOSPITAL FOR SICK CHILDREN, Great Ormond-st., W.C.
WEDNESDAY, Feb. 26th.—2 P.M., Dr. Donald Paterson: Bronchitis and Asthma. 3 P.M., Dr. Donald Bateman: Tests for Allergen Sensitivity.
 Out-patient Clinics daily at 10 A.M. and ward visits at 2 P.M.
LONDON SCHOOL OF DERMATOLOGY, 5, Lisle-street, W.C.
TUESDAY, Feb. 25th.—5 P.M., Dr. W. N. Goldsmith: Pigmentary Disorders.
THURSDAY.—5 P.M., Dr. A. Burrows: Malignant Conditions of the Skin.
FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Feb. 24th, to **SATURDAY**, Feb. 29th.—**INFANTS HOSPITAL**, Vincent-square, S.W. Mon., Wed., and Fri., 8 P.M., F.R.C.S. primary course.—**BROMPTON HOSPITAL**, S.W., All-day course in thoracic surgery.—**NATIONAL TEMPERANCE HOSPITAL**, Hampstead-road, N.W., Tues. and Thurs., 8 P.M., M.R.C.P. course.—**NATIONAL TEMPERANCE HOSPITAL**, Hampstead-road, N.W., Tues., 8.30 P.M., Mr. A. E. Porritt: Infection of Bones, and Thurs., Mr. R. Coyte: Large Intestine and Rectum.—**St. JOHN'S HOSPITAL**, 5, Lisle-street, W.C. Afternoon course in dermatology (open to non-members).—Courses are open only to members of the fellowship.
SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.
WEDNESDAY, Feb. 26th.—4 P.M. (St. James' Hospital, Ouseley-road, S.W.12), Dr. R. F. L. Hewlett: The Value of Blood Examinations.
WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.6.
MONDAY, Feb. 24th.—10 A.M., Skin Clinic. 11 A.M., Surgical Wards. 2 P.M., Gynecological and Surgical Wards, Eye and Gynecological Clinics. 4.15 P.M., Mr. Green-Armytage: Abdominal Pain in Pregnancy.
TUESDAY.—10 A.M., Medical Wards. 11 A.M., Surgical Wards. 2 P.M., Throat Clinic.
WEDNESDAY.—10 A.M., Children's Clinic and Wards. 11 A.M., Medical Wards. 2 P.M., Eye Clinic. 4.15 P.M., Dr. R. W. Ironside: Anesthesia.
THURSDAYS.—10 A.M., Neurological and Gynecological Clinics. Noon, Fracture Clinic. 2 P.M., Eye and Genito-urinary Clinics.
FRIDAY.—10 A.M., Skin Clinic, Medical Wards. 12 noon, Lecture on Treatment. 2 P.M., Throat Clinic. 4.15 P.M., Mr. Vlasto: Pyogenic Infections of the Ear.
SATURDAY.—10 A.M., Children's and Surgical Clinics, Medical Wards.
 Daily.—2 P.M., Operations, Medical and Surgical Clinics. The lectures at 4.15 P.M. are open to all medical practitioners without fee.
LEEDS GENERAL INFIRMARY.
TUESDAY, Feb. 25th.—3.30 P.M., Dr. Tattersall: Tuberculosis Demonstration.
LEEDS PUBLIC DISPENSARY.
WEDNESDAY, Feb. 26th.—4 P.M., Mr. L. N. Pyrah: The Treatment of Burns and Surgical Cutaneous Septic Conditions.
ANCOATS HOSPITAL, Manchester.
THURSDAY, Feb. 27th.—4.15 P.M., Dr. W. J. S. Reid: Polycythemia.
UNIVERSITY OF DURHAM.
SUNDAY, March 1st.—10.30 A.M. (Newcastle General Hospital), Prof. T. Beattie: Medical Ward Visit.
GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY, Feb. 26th.—4.15 P.M. (Ear, Nose, and Throat Hospital), Dr. R. J. Watson: The Accessory Sinuses.

COMMITTEE ON NUTRITION.—At its first meeting on Feb. 15th the League of Nations committee on nutrition agreed on the general lines of the report to be prepared, took steps to obtain further information from governments and national authorities, and appointed a drafting committee which is to meet on May 4th, before a second session of the full committee to be held early in June. The committee unanimously adopted the report of the Technical Commission (which appeared in THE LANCET of Dec. 21st, 1935, p. 1434) which lays down the principles for a scientifically balanced diet for different ages and categories of human beings. This report is to serve as the basis for a big programme of research work in different countries.

NOTES, COMMENTS, AND ABSTRACTS

THE CINEMA IN MEDICINE

THE catalogue published¹ this week, of British medical films "of technical interest to medical practitioners and students," is a first attempt to collect under one cover British made films which are likely to be of value, not only in medical teaching but in medical practice. The British Film Institute, formed in 1933 on the recommendation of the Commission on Educational and Cultural Films, has an advisory committee on which are represented various Government departments, including the Ministry of Health and the Board of Education, and from this committee is set apart a panel of medical men interested in the use of films for instructional purposes. This medical panel undertook to collect information on existing medical films in this country, for this purpose addressing a questionnaire to all the medical schools and universities in Great Britain. The present catalogue is the result of this inquiry.

The films catalogued are classified under 9 sections and 42 subsections, which include most of the subjects taught in the medical curriculum. Against each is given title, date, author, width, silent or sound, length, name and address of owner, and (with excellent intent) whether suitable for undergraduate or post-graduate students, for nurses, or for public health propaganda. Supplements to the catalogue will be issued as need arises. There may be in existence medical films made by individuals or associations primarily for their own use but which may be of more general interest; the panel is anxious to secure full particulars of such films. In too many of the films viewed the medical panel noted with regret that the producers seemed to have had no clear idea of what it was they wished to demonstrate or at least of the best methods of demonstrating the points they wished to drive home. Sometimes an otherwise good film lost much of its teaching value for lack of appropriate captions and/or moving diagrams. The medical panel offers technical advice to those embarking on the production of medical films, in order to ensure the best use of the material available.

The use of films in all parts of the medical curriculum is increasing. Lecturers in such subjects as pharmacology, physiology, anatomy and biology, for example, frequently make films to illustrate their lectures, seeking in this way to save time and to retain the attention of large classes. While "speech" films may have their use in illustrating the operative technique of a distinguished surgeon, the panel considers that the field for such films in medical education is limited, and they have the disadvantage of thrusting into the background the personality of the teacher on the spot. A film, however good, is not intended to replace the lecturer but only to supplement his teaching. Slow-motion photography gets a good word from the panel. It provides a simple method of illustrating complicated technique and a means of studying movements which are ordinarily performed too quickly for the student to follow. In any case the lecturer should be able to stop a film when he wants in order to demonstrate details of a picture. There are projectors on the market in which it is possible to hold the picture without damage to the film or serious loss of light.

Most of the silent films are narrow ones. The 16 mm. film is non-inflammable and can be shown without danger in lecture hall or private house. For demonstration to a class of students at a moment's notice this type of film will probably be found the most useful for some time to come. The keen medical student will welcome the opportunity of supplementing his reading by looking at a film of the subject which he is studying. There are on the market at the present time projectors for 16 mm. silent

films, varying in price from £30 to as little as £6 15s., the latter being suitable for two or three persons in an ordinary room. The larger projectors can be hired for £1 a night. Even so the moving picture will often be beyond the student's purse, and commercial firms which produce films of medical or scientific interest might well arrange to show for a modest fee at their own theatres films of interest to the medical student. The British Film Institute would assist the student if willing to show in a theatre for a nominal fee a film which a student may have borrowed or have made himself. It is of real importance for medical education that the student should be able, outside of official lecture hours, to see films which will help him in that part of the medical curriculum which he happens to be studying.

GOTHIC WOMEN

THE nineteenth century woman was a mystifying creature. After a childhood of suppression and a girlhood in which vapidity was at a premium, she reached a maturity of wifely subservience and excessive reproduction. But if she survived the childbearing period with spirit unimpaired she usually came into her own as the tyrant grandmother—no fiction, but a valiant unscrupulous personage found surviving in many families in the early years of this century. How did she manage it? How could a youth of tight-lacing equip her for such heroic physical achievement; and when, during a much-occupied middle age, did she find opportunity to develop the qualities of a dictator? Can she be explained, like the older type of hospital matron, by saying: "If you trample on a person hard enough you have taught her all there is to know about trampling when her turn comes"? Perhaps she cannot be summed up in a formula at all, but at any rate much can be learnt about her from Dr. C. Willett Cunningham's "Feminine Attitudes of the Nineteenth Century"¹

Dr. Cunningham has an agreeable formula of his own. "Gothic Art," he says, "has been defined by an eminent authority, as 'the Art of constructing buttressed buildings.'" For him the nineteenth century woman is essentially Gothic. "How ingeniously her human qualities were buttressed by romantic ideals helping to sustain the great illusion! How carefully the fundamentals, on which her charms were based, were hidden! . . . Somewhere within that monolith was hidden a creature of flesh and blood." Nevertheless he remains baffled. He pursues her attitudes through the century rather like a terrier digging out a strange quarry; but when she is at last exhumed we find on his face the puzzled look of the terrier, wondering what this thing can be. What did she think of it all? Was she conscious of the pose or was she playing the game blindfold? Most disquieting of all, what was her real opinion of the Victorian man?

With illustration and quotation Dr. Cunningham traces the development of the Gothic attitude from the "cool, curious, and informed young woman" of the early years of the century, through the increasing romanticism of the 'thirties, the sentimental 'forties (when women were assured that "the opposite sex love, respect, and adore them and ever will, so long as they retain that inestimable jewel Virtue") to the Perfect Lady of the 'fifties. Thence Victorian woman declined through the revolting 'sixties (in a rebellious sense) the ornamental 'seventies, the symbolic 'eighties—illustrated by drawings of Girton girls in bustles and an academic aura—to the prude's progress in the 'nineties. And a charming history it all makes. Perhaps the reader will feel that not much has been proved, and that the light thrown on the scene has made the shadows look more impenetrable than ever, but he is bound to enjoy the extracts from novels and from

¹ British Film Institute, 4, Great Russell-street, London W.C.1. 1s.

¹ London: William Heinemann Ltd. Pp. 314. 12s. 6d.

magazines for young ladies, the advertisements of "beauty animated and vision preserved," of "the pneumatic tube coil . . . to all appearance an ordinary switch of hair," and one addressed to the Nobility and Gentry by Tiffin and Son, Bug-Destroyers to the Royal Family, who "beg to suggest the propriety of having this nuisance removed."

Appointments

BAILEY, K. C., M.B. Camb., has been appointed Assistant Medical Officer at Croydon Mental Hospital.
 BONNELL, JANE, M.R.C.S. Eng., Assistant Medical Officer at the Royal Eastern Counties Institution, Colchester.
 BOWES, R. K., M.D., M.S. Lond., F.R.C.S. Eng., Obstetric Physician in Charge of Out-patients at St. Thomas's Hospital, London.
 BROWN, A. I. P., M.B. Lond., Anaesthetist for the borough of Willesden.
 EBBAGE, G. B., M.R.C.S. Eng., Resident Surgical Officer at the Birmingham and Midland Eye Hospital.
 GILBERT, BARTON, M.D. Lond., F.R.C.S. Eng., Gynaecological Pathologist to the Chelsea Hospital for Women.
 LIVINGSTONE, G. H., M.B. Lond., F.R.C.S. Eng., Ear, Nose, and Throat Surgeon for the borough of Willesden.
 MACDONALD, DONALD, M.B., D.P.H., Resident Medical Officer at the Halifax Isolation Hospital.
 MAXWELL, JAMES, M.D., F.R.C.P. Lond., Assistant Physician to St. Bartholomew's Hospital, London.
 MELVILLE, A. G. G., M.B., D.R., F.R.C.S. Edin., Assistant Radiologist at the Victoria Infirmary, Glasgow.
 MILLER, A. C., B.Sc., L.M.S.S.A., D.O.M.S., Hon. Assistant Surgeon to the Sussex Eye Hospital.
 MONK, H. E., B.Sc., F.I.C., County Analyst and Bacteriologist for Worcestershire.
 PORTEOUS, M. I., M.B. Edin., D.P.H., Assistant Medical Officer of Health for the county borough of Warrington.
 SHAWCROSS, E. W. H., M.R.C.S. Eng., D.M.R.E., Radiologist at the Samaritan Free Hospital for Women, London.
 SPENCE, A. W., M.D., M.R.C.P. Lond., Assistant Physician, and Assistant Director of the Medical Professorial Unit, St. Bartholomew's Hospital, London.
 TYRRELL, T. M., M.B. Camb., F.R.C.S. Eng., Assistant Hon. Surgeon to the Royal Eye Hospital, London.
 WRIGLEY, A. J., M.D. Lond., F.R.C.S. Eng., Obstetric Physician to St. Thomas's Hospital, London.
 YEO, K. J., M.B. Camb., D.M.R.E., Hon. Radiologist to the Royal Northern Hospital, London.

Vacancies

For further information refer to the advertisement columns
 Albert Dock Hospital, Connaught-road, E.—Res. M.O. At rate of £110.
 Benenden, Kent, National Sanatorium.—Jun. I.I.P. At rate of £150.
 Birmingham Ear and Throat Hosp.—Third I.I.S. At rate of £150.
 Birmingham, Queen's Hosp.—Sen. Res. Anaesthetist. £70-£100.
 Birmingham, St. Chad's Hosp.—Jun. Res. M.O. At rate of £150.
 Blackburn, Queen's Park Hospital and Institution.—Res. Jun. Asst. M.O. At rate of £150.
 Bolton Royal Infirmary.—Res. Surg. O. £250.
 Bradford Royal Infirmary.—H.S. At rate of £135.
 Brighton, Royal Sussex County Hospital, and Howe General Hospital.—Hon. Physiotherapist. Also Hon. Med. Reg.
 Bristol University.—Asst. Clin. Path. £375.
 British Postgraduate Medical School, Ducane-road, W.—Two First Asssts. for Dept. of Surgery. Each £250-£500.
 Cambridge, Addenbrooke's Hospital.—H.S. At rate of £130.
 Cancer Hospital, Fulham-road, S.W.—Res. M.O. for Radium Dept. At rate of £100.
 Cardiff, Welsh National School of Medicine.—Lord Merthyr Research Scholarship. £200. Also Mrs. John Nixon and Ewen Maclean Research Studentships. Each £150.
 Central London Ophthalmic Hospital, Judd-street, W.C.—Sen. and Jun. H.S. £120 and £100 respectively.
 Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Two Asssts. in Out-patient Dept.
 Charing Cross Hospital, W.C.—Surg. Reg. £150. Also Obstet. Reg. and Registrar. Each £100.
 Chester, County Mental Hospital.—Jun. Asst. M.O. £350.
 City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—Physician to In-patients.
 Dewsbury and District General Infirmary.—Second H.S. £150.
 Dreadnought Hospital, Greenwich, S.E.—H.P. and H.S. Each at rate of £110.
 Edinburgh, National Association for the Prevention of Tuberculosis.—Secretary-General. £600.
 Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Clin. Asssts. to Medical Dept.
 Exeter, Royal Devon and Exeter Hospital.—H.S. to Ear, Nose, and Throat Dept. At rate of £150.
 Guildford, Royal Surrey County Hospital.—H.S. Also H.P. and Cas. O. Each at rate of £150.
 Harrogate and District General Hospital.—H.P. and Cas. O. Also H.S. Each at rate of £150.
 Herefordshire General Hospital.—H.P. Also H.S. and Cas. O. Each at rate of £100.
 Hospital for Tropical Diseases, Gordon-street, W.C.—H.P. At rate of £120.
 Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W. Surg. Reg. £100. Also Clin. Asst. to Ear, Nose, and Throat Dept.

Huddersfield Royal Infirmary.—Cas O. £200. Also H.S. At rate of £150.
 Kesleven County Council.—M.O.H. £1000.
 Leicester County Sanatorium and Isolation Hospital, Markfield.—Jun. Res. M.O. At rate of £300.
 Leicester Royal Infirmary.—Res. Anaesthetist. At rate of £150.
 Cas. O., H.S., and H.P.'s. Each at rate of £125. Also Jun. Cas. O. At rate of £100.
 Liverpool, Bootle General Hospital.—H.P. and H.S. Each at rate of £150.
 Liverpool, Hospital for Consumption and Diseases of the Chest, Mount Pleasant.—Res. M.O. £150.
 Liverpool, Royal Babies Hospital.—Res. M.O. At rate of £90.
 Liverpool, Royal Children's Hospital.—Res. Surg. O. for Heswall Branch. At rate of £120.
 London Homœopathic Hospital, Great Ormond-street, W.C.—Hon. Surgeon. Also Hon. Asst. Surgeon.
 Maidenhead Hospital.—Hon. Physician.
 Maidstone, West Kent General Hospital.—H.P. £175.
 Manchester, Duchess of York Hospital for Babies.—Sen. and Jun. Res. M.O.'s At rate of £125 and £75 respectively.
 Manchester Royal Children's Hospital, Gartside-street.—Two Asst. M.O.'s for Out-patients' Dept. Each at rate of £150.
 Manchester Royal Infirmary.—Jun. Asst. M.O. for Radiological Dept. £350.
 Manor House Hospital, Golders Green, N.W.—Jun. M.O. £200.
 Mellon, Suffolk, St. Audry's Hospital.—Jun. Asst. M.O. £350.
 Middlesbrough County Borough.—M.O.H. for Maternity and Child Welfare. £350.
 Middlesex County Council.—Tuberculosis Sanatorium, South Mimms. Deputy Med. Supt., &c. £450.
 Mount Vernon Hospital, Northwood.—H.S. At rate of £150.
 Norwich, Norfolk and Norwich Hospital.—Res. M.O. £250. Also Res. Orthopaedic O. £200.
 Nottingham General Hospital.—H.S. for Fracture and Orthopaedic Depts. £300. Also H.S. to Ear, Nose, and Throat Dept. At rate of £150.
 Plymouth City General Hospital.—Jun. Asst. M.O. £250.
 Plymouth, Prince of Wales's Hospital, Greenbank-road.—H.S. and H.P. Each at rate of £120.
 Preston, Biddulph Grange Orthopaedic Hospital.—Jun. H.S. At rate of £200.
 Preston Royal Infirmary.—H.S. for Obstet., Eye, and Ear Wards. £150.
 Preston, Sharoe Green Hospital.—Sen. and Jun. Asst. Res. M.O.'s. At rate of £200 and £100 respectively.
 Prince of Wales's General Hospital, N.—Res. Jun. H.P. and H.S.'s. Each at rate of £90. Also Hon. Med. and Surg. Regs. Each £100.
 Princess Louise Kensington Hospital for Children, St. Quintin-avenue, W.—H.S. At rate of £100.
 Queen's Hospital for Children, Hackney-road, E.—H.P. and Cas. O. Each at rate of £100.
 Rhondda Urban District Council.—Asst. M.O. £500.
 Rochdale, Birch Hill Hospital.—Jun. Res. M.O. At rate of £200.
 Rochdale Infirmary and Dispensary.—Second H.S. £150.
 Rotherham Hospital.—Sen. H.S. or P. £200. Also Cas. H.S. £150.
 Royal Army Medical Corps.—Commissions.
 Royal College of Surgeons of England.—Election to Court of Examiners.
 Royal Eye Hospital, St. George's-circus, S.E.—Part-time Pathologist and part-time Bacteriologist. Each £100. Also Sen. H.S. and two Asst. H.S.'s. At rate of £150 and £100 respectively.
 Royal Masonic Hospital, Ravenscourt Park, W.—Res. Surg. O. At rate of £250.
 St. Bartholomew's Hospital Medical College.—Sen. Demonstrator in Dept. of Pathology. £400.
 St. George's Hospital, S.W.—Asst. Bacteriologist. £500.
 St. Leonards-on-Sea, Buchanan Hospital.—Jun. H.S. £125.
 St. Peter's Hospital for Stone, &c., Henrietta-street, W.C.—H.S. At rate of £75.
 Shorham-by-Sea, Southlands Hosp.—Second Asst. Res. M.O. £300.
 South Shields, Ingham Infirmary.—Jun. H.S. £150.
 Stockport Infirmary.—H.P. £150.
 Stoke-on-Trent, Stanfield Sanatorium.—Res. M.O. £250.
 Swansea County Borough.—Asst. M.O. £500.
 Warrington County Mental Hospital, Winwick.—Asst. M.O. £500.
 West London Hospital, Hammersmith-road, W.—H.P. and H.S. to Spec. Depts. Each at rate of £100.
 Whitechapel Venereal Diseases Clinic, Turner-street, E.—Director. £1250.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Wrexham (Denbigh).

Births, Marriages, and Deaths

BIRTHS

GRATRIX.—On Feb. 8th, at Redcliffe-gardens, South Kensington, S.W., the wife of Dr. William H. Gratrix, of a daughter.
 ORME.—On Feb. 6th, at Bidston, Matlock, the wife of Dr. C. L'Estrange Orme, of a son.
 SMITH.—On Feb. 8th, at Topsham, Devon, the wife of Dr. E. H. Protheroe Smith, of a daughter.
 THROWER.—On Feb. 10th, at Belvidere, Weymouth, the wife of William Rayner Thrower, M.D., M.R.C.P. Lond., of a son.

DEATHS

DONALDSON.—On Feb. 14th, at a Coventry nursing-home, James Smith Donaldson, M.B. Glasg., of Balsall Commou, aged 37 years.
 GUBB.—On Feb. 3rd, suddenly, at Mustapha Supérieur, Algiers, Alfred S. Gubb, M.D. Paris, M.R.C.S. Eng., D.P.H.
 N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

ADDRESSES AND ORIGINAL ARTICLES

ON THE PROPHYLACTIC ACTION OF
"BAYER 205" AGAINST THE
TRYPANOSOMES OF MAN

CONCLUDING OBSERVATIONS

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THE preliminary paper of this research was published in this journal in June, 1934. In that paper a brief summary was given of the work already done on Bayer 205 as a prophylactic against the trypanosomes of man, but no reference was made to the work of Fourche and Haveaux (1931), of which at the time I was not aware. These investigators concluded that preventive treatment should be restricted to the healthy while the infected are undergoing cure, doubtful cases being rigorously excluded; that at least two doses of Bayer 205 should be employed; and that the preventive effect can be relied upon for from six to seven months at most.

In December, 1934, there appeared a paper by Corson on the action of Bayer 205 on *Trypanosoma rhodesiense* in white rats infected by tsetse flies (Corson b). The author, to use his own method of presenting his results, found that a dose of 0.015 g. per kg. body-weight did not protect these animals for 21 days, and that a dose of 0.03 g. failed to protect for 40 days. He concluded that the drug has a strong prophylactic action in animals and may be presumed to have the same in man; also that the action varies somewhat in degree in individual animals of the same species, and it may be expected that this will also occur in man. He also remarked, "The chief difficulty seems to be the question whether the drug might cause such alteration of the virulence of the trypanosomes as to make diagnosis difficult."

THE PRELIMINARY INVESTIGATIONS

The following is a summary of the investigations already described in THE LANCET (1934, 1., 1336).

Two groups of native volunteers were taken. The first consisted of 4 men, A., B., C., E., who had recently been experimentally infected with *T. rhodesiense* and then treated with Bayer 205 immediately trypanosomes were seen in their blood (i.e., 8-11 days after the act of infection). Each man had received six doses of Bayer 205 in 1.0 g. doses intravenously at intervals of a few days. The second group comprised 3 virgin volunteers, I., M., and Q., each of whom received a single intravenous injection of 1.0 g. Bayer 205. In every instance exposure to infection was by the bite of tsetse known to be infective to man, 7 clean volunteers being used as controls. The results of the investigation were as follows: The men A., B., C., and E. resisted *T. rhodesiense* for at least 190, 180, 182, and 105 days respectively, these figures relating to their last exposure to infection. Volunteer B., who was still protected at the 180th day against *T. rhodesiense*, was infected by *T. gambiense* between the 208th and 212th days after the last dose of Bayer 205. Volunteers I., M., and Q., who received a single dose, were protected against *T. rhodesiense* for at least 111, 113, and 108 days. Volunteer M., when exposed to *T. gambiense* on the 145th day, became infected. Those who escaped infection—namely, A., C., I., and Q., remained under observation in perfect health for more than 18 months, after which all of them were employed again.

In the discussion that followed it was suggested that the degree of protection conferred might be to some extent

proportional to the quantity of Bayer 205 administered, a conclusion also reached by Browning and Gulbransen (1934) in their work on *T. brucei* in mice. It appeared possible also that the protection conferred by Bayer 205 was greater against *T. rhodesiense* than *T. gambiense*; either because the greater biological adaptation of *T. gambiense* to man rendered that trypanosome in some way less susceptible to the drug in man, or because of the greater susceptibility of *T. rhodesiense* to the drug. Findlay (1930) records that Moranyl is less efficient against *T. gambiense* than *T. rhodesiense*.

Two experiments performed with monkeys suggested that the greater the susceptibility of the vertebrate to the trypanosome the less efficient the protection conferred by the drug; in other words, that an animal's natural resistance helps the Bayer 205 to stave off the trypanosome.

The use for the first time of native volunteers on a large scale involved difficulties that have since been largely overcome, and explained the inclusion of the men of Group I. These were the first volunteers to come forward and were willing to serve again. It was realised that there were objections to their employment—i.e., the large amount of Bayer 205 administered and the possible immunising effect of the liberation of antigen following the destruction of the trypanosomes by the first dose. But time and opportunity were pressing and no one else was available.

The Inquiry Continued

The full extent of the protection conferred by the drug against *T. rhodesiense* was not determined as no protected volunteer succumbed to that trypanosome, the only 2 men who were infected falling to *T. gambiense*. In the course of the present investigations, several of the volunteers after having been infected and treated were later on again exposed to infection. Table I. gives brief details of their exposure to reinfection:—

TABLE I
Re-exposure of Experimentally Infected Volunteers to
Infection, at 6-16 Months after Cessation of Treatment

Volunteer.	Trypanosome and date of first infection.	Last dose of treatment.	Trypanosome and date of subsequent infection.
A.	rhodesiense (30.viii.33)	29.ix.33	rhodesiense (15.vii.35)
B. (1)	rhodesiense (23.viii.33)	30.ix.33	—
B. (2)	gambiense (28.iv.34)	29.vi.34 (tryparsamide)	gambiense (22.vi.35)
D.	rhodesiense (8.iii.34)	26.iv.34	rhodesiense (7.v.35)
E.	rhodesiense (6.ix.33)	13.xii.33	rhodesiense (1.iii.35)
M.	—	1.0 g. Bayer 205 prophylactic, 13.xii.33	—
	gambiense	6.vi.34 (tryparsamide)	rhodesiense (2.vii.35)
K.	rhodesiense (16.iii.34)	23.iv.34	rhodesiense (23.vi.35)
Z. A.	gambiense (12.iv.34)	9.v.34 (tryparsamide)	rhodesiense (10.vi.35)
A. A.	gambiense (18.ii.35)	3.iv.35 (tryparsamide)	rhodesiense (15.x.35)
E. E.	gambiense (21.ii.35)	5.iv.35 (tryparsamide)	gambiense (18.x.35)

The evidence presented in the two Tables of this paper suggests that the maximum immunity is obtained from the frequently repeated destruction of living trypanosomes in an organism initially protected by Bayer 205.

The great majority of the volunteers infected with *T. rhodesiense* and treated with Bayer 205 experienced, immediately after their first injection, a rise of temperature to 104-106° F., falling in 36-48 hours to normal where it continued. From a

study of the charts of all the men employed, it would appear that the patient's reaction when *T. gambiense* is treated with tryparsamide is less severe than that following treatment of *T. rhodesiense* with Bayer 205.

A striking exception to the usual response to treatment was shown by one of the volunteers.

He was admitted with a temperature of 103° F., and received his first dose of Bayer 205 when his temperature was 100° F., after which for 48 hours it fluctuated between 99° F. and 101° F. Then, following a second Bayer 205 injection, the temperature rose to 105° F. and remained remittent around that level for nine days, during which another injection of Bayer 205 and two of quinine were given, malaria having been found in his blood. The fourth dose of Bayer 205 was followed by yet another rise to 105° F., and 36 hours later the temperature fell to normal and remained there.

This extraordinary course cannot, I think, be attributed to the coincident malaria, for a number of the volunteers had this parasite simultaneously with trypanosomes. It is, rather, an example of an idiosyncrasy either for the products of the destruction of the trypanosomes or for the drug itself.

In none of the men of Table I. was the incubation period prolonged. These reinfections show that any immunity conferred by a brief (10–15 days) infection with *T. rhodesiense* or *T. gambiense* followed by a course of six injections with Bayer 205 or tryparsamide, does not persist for as long as 6–16 months.

CONTROL MEASURES DURING THE INVESTIGATION

It is of course necessary to prove the infectivity of the tsetse before they bite man; and similarly when the syringe is used, the inoculum must be proved to be infective to animals when it is introduced into the volunteer. The former process takes up time and so increases the likelihood of infective flies dying before they have bitten man. But in addition to ordinary routine precautions against the casual infection of experimental animals (described elsewhere, Duke, 1934), the employment of man introduces new complications. Natives differ individually in their natural resistance to trypanosomes, and strains of human trypanosomes, particularly *T. rhodesiense*, may alter from time to time in their pathogenicity to man. It is impossible to present all experimental details, and the reader must accept the assurance that the strains used in these experiments were indeed infective to man, as proved by control experiments on man at frequent intervals.

Another difficulty has been the provision of an adequate number of gland-infected flies with which to ensure exposure of the volunteers to infection. In the experiments recorded in this paper over 16,000 flies were dissected of which 120 had gland infections, more than half of these last dying before they were ever fed on man.

It was hoped during these experiments to secure decisive evidence whether there is any essential difference between the results obtained by fly-bite and by syringe infection, but this proved impracticable. The former method is to be regarded as the more reliable in assessing the value of the prophylactic, as it is the method encountered in nature. I have discussed elsewhere (Duke, 1935) the two modes of infection and, in opposition to certain investigators, still believe that subcutaneous inoculation of infected blood may give misleading results, especially when the pathogenicity of a trypanosome to man is under investigation. In these experiments the syringe method has been used mainly under constraint, in default of a sufficient number of gland-infected flies.

And now a word to the impatient. The investigation, from whatever angle, of the behaviour of human trypanosomes in man involves contact with a number of different factors. In the present inquiry, for example, the following have to be borne in mind: differences in man's individual resistance to trypanosomes; the characters of different strains of trypanosomes; the immunising effect (so far quite

unknown) of repeated small inoculations of living metacyclic or blood trypanosomes into an individual still under the protection of Bayer 205; and the rate and extent of absorption and elimination of the drug in the individual. All these are variables, and we must therefore be content for the time being with rough indications rather than accurate scientific conclusions. Indeed the more one studies the trypanosomes of the *brucei* group in relation to man himself the more apparent becomes our ignorance of his true place in their economy in nature.

EXPLANATION OF TABLE II

Table II. sets forth the details of the exposure and response of the volunteers to infection.

Of the 53 gland-infected flies actually used in these experiments, 34 came from different boxes—i.e., one infective fly per box; the other seven boxes each contained 2–4 infective flies. Each single box of flies, before being placed on a volunteer had infected at least one clean animal and often more. Fly No. 15, for example, in the course of its career of 86 days, infected in turn a guinea-pig, 2 unprotected volunteers, 3 antelopes, and a monkey. Each infective fly is distinguished in the Table by a number, and where more than one occurred in the same box a letter is added. For obvious reasons it was impossible to test every fly on a separate clean volunteer, but the following were actually proved able to infect man: Nos. 1, 2a, b, c, and d, 3a and b, 5, 8, 10, 14, 17, and 18a, b, c, and d, 33a and b, and 41. The untested majority all carried strains known to be readily infective to man.

In the course of investigations at this laboratory and particularly during the last six months, flies infective with certain lines of *T. rhodesiense* have been found to be non-infective to unprotected volunteers. Such trypanosomes have therefore been excluded from the Table. Only two strains of *T. rhodesiense* have been used in these experiments and great care has been taken throughout only to use lines of these two strains that have given recent evidence of pathogenicity to man. More exact control than this was not possible. Ideally, each individual fly should be tested independently on several volunteers—obviously an unattainable ambition. Work of this kind is full of surprises, and there have been incidents here and there in the course of these and other kindred investigations which do indeed suggest that with "borderline" strains individual flies may differ in their ability to infect man. The evidence for this is admittedly slight, but the possibility cannot be dismissed merely because it appears to be improbable.

The volunteers were exposed to infection by one of two methods; either by allowing infective flies to bite them, or by subcutaneous inoculation of blood containing living trypanosomes. The method used is shown in the columns under "exposure to infection." Every inoculation recorded in the Table was accompanied by controls, all of which were promptly infected. All the inoculations of salivary glands of infective flies were likewise controlled, and none is recorded unless the control rat or guinea-pig became infected with the opposite gland of the same fly. The inoculation of salivary glands was always additional to the exposure by fly-bite recorded in column 4.

The incubation period (in days) is calculated to the day when trypanosomes were first found in stained thick films of the blood. The dose of Bayer 205 received by each volunteer is shown under his designation in column 1: Thus, 1.0 g. = a single intravenous injection of 1.0 g. of Bayer 205, irrespective of body-weight; 2.0 g. = a single dose of 2.0 g.; 1.0 + 1.0 g. = two doses of 1.0 g. each, separated by 21 days. No attempt was made to standardise the amount of Bayer 205 administered according to the weight of the volunteer, and in practice it is unlikely that this would be done. The net weight of each man in kilos is shown in column 1 of the Table; it will be noted that only two touch 10 st. (63.6 kg.).

Every fly before being placed on the volunteer was either starved for 72 hours and then given one opportunity of feeding, or starved for 48 hours and then put on him on the two succeeding days. All flies that refused to feed were at once killed and dissected.

TABLE II.—SHOWING THE MODE OF INFECTION OF THE VOLUNTEERS AND THE DIAGNOSIS

Volunteer, prophylactic dosage, and weight in kg.	No. of day after last dose of Bayer 205.	Exposure to infection.			Inoculation of volunteer's blood into clean monkey.	Volunteer, prophylactic dosage, and weight in kg.	No. of day after last dose of Bayer 205.	Exposure to infection.			Inoculation of volunteer's blood into clean monkey.		
		Trypanosomes.	By tsetse (serial numbers).	By inoculation of infective blood.				Result.	Trypanosomes.	By tsetse (serial numbers).		By inoculation of infective blood.	Result.
F. E. 1.0 g. 48.5	92-94	G.	2a, b, c, d	c.c.	+	inc. 17	..	P. P. 1.0+ 123-136	R.	10, 11, 15	..	Nil.	..
K. K. 1.0 g. 51	119-120	G.	2a, b, c, d 3a, b, 4	..	..	Nil.	..	1.0 g. 160-161	R.	11	..	Nil.	..
F. F. 1.0 g. 47	96	G.	2a, b, c, d	..	Nil.	..	..	51.5 170-171	R.	5, 16	..	Nil.	..
I. I. 1.0 g. 57.5	110-111	G.	2a, b, c, d	..	Nil.	..	..	203-204	R.	38	..	Nil.	..
Z. E. 1.0 g. 60	122-123	R.	5	..	Nil.	..	..	223	R.	..	1	+	inc. ?
U. U. 1.0 g. 54.5	138-140	G.	3a, b, 6a, 7	..	+	inc. 14	..	G. G. 1.0+ 98-99	G.	2a, b, c, d	..	Nil.	..
Z. M. 1.0 g. 52	105-107	G.	1	..	+	inc. 19	..	122-124	G.	2a, b, c, d	..	Nil.	..
Z. F. 1.0 g. 53	127	..	..	..	..	Nil.	..	156-159	G.	3a, b, 4, 7, 8	..	Nil.	..
Z. G. 1.0 g. 54	146-148	R.	20, 23a, b 22b, c, 28, 30	..	+	..	..	166	G.	..	..	Nil.	..
	174	..	..	..	..	Nil.	..	187	G.	..	..	Nil.	..
	181	..	..	..	..	Nil.	..	222	R.	..	1	+	inc. 10
	103-104	R.	10	..	Nil.	..	..	H. H. 1.0+ 104-106	G.	2a, b, c, d	..	Nil.	..
	121-122	R.	11	..	Nil.	..	..	1.0 g. 115	G.	2a, b, c, d	..	Nil.	..
	135-136	R.	11	..	Nil.	..	..	154-157	R.	5, 25	..	Nil.	..
	141-142	R.	10	..	Nil.	..	..	169	G.	4	..	Nil.	..
	150-151	R.	5	..	Nil.	..	..	205-206	R.	17	..	Nil.	..
	167-168	R.	12	..	Nil.	..	..	224-226	R.	18a, b, c, d	..	+	inc. 10-13
	171	R.	..	..	Nil.	..	..	O. O. 1.0+ 118-119	R.	10, 11	..	Nil.	..
	198	R.	14	..	Nil.	..	..	1.0 g. 130-136	R.	10, 11, 15	..	Nil.	..
	212	R.	17	..	Nil.	..	..	1.0 g. 148	R.	10	..	Nil.	..
	237-238	R.	18c, d, 19	..	Nil.	..	..	57.5 163-164	R.	5	..	Nil.	..
	252-253	R.	28	..	Nil.	..	..	233	R.	18b, c, d, 19	..	+	inc. 10
	262-263	R.	22a, b, c, 23b	..	..	..	..	Z. H. 2.0 g. 97	R.	..	1	Nil.	..
	286-289	R.	33a, b, 35	..	..	..	..	131	R.	..	1	Nil.	..
	301	..	..	..	..	..	5 c.c. : nil.	150	..	..	..	..	5 c.c. : nil.
	306	..	..	..	..	..	5 c.c. : +, inc. 7	63-5	R.	29	..	Nil.	..
	307	R.	37	..	Nil.	..	..	151	R.	20, 21	..	Nil.	..
	320	..	..	..	..	..	..	162-163	R.	..	..	..	..
	320-323	R.	38, 39	..	..	..	..	200	..	..	..	..	..
	327	R.	41	..	..	..	..	203	R.	..	1	+	inc. 10
	344	..	..	..	..	..	..	103	R.	..	1	Nil.	..
	347	..	..	..	..	..	..	155	R.	..	1	Nil.	..
	350	R.	..	..	..	..	..	179	..	..	..	..	5 c.c. : nil.
	365	..	..	..	..	..	..	103	R.	..	1	Nil.	..
	93	R.	..	..	..	..	..	155	G.	..	1	..	..
	120-121	R.	18c, d, 27	..	..	..	..	179	..	..	..	..	..
	149-150	R.	30	..	..	..	..	179	R.	..	1	+	inc. ?
	165-166	R.	32, 36	..	..	..	..	203	..	..	..	..	..
	180	..	..	..	..	..	..	209	R.	..	1	..	..
	180	R.	..	..	..	..	..	104	R.	..	1	Nil.	..
	209	..	..	..	..	..	..	128	G.	..	1	Nil.	..
	211	R.	..	..	..	..	..	152	..	..	..	..	5 c.c. : nil.
	211	R.	..	..	..	..	..	152	R.	..	1	Nil.	..
		..	..	..	..	..	..	174	..	..	..	..	5 c.c. : nil.
		..	..	..	..	..	..	175	R.	..	1	+	inc. 14
		..	..	..	..	..	..	130	R.	..	1	Nil.	..
		..	..	..	..	..	..	153-156	R.	27, 29	..	Nil.	..
		..	..	..	..	..	..	54.5	R.	21	..	Nil.	..
		..	..	..	..	..	..	180	R.	22b, c	..	Nil.	..
		..	..	..	..	..	..	200	..	..	..	..	5 c.c. : nil.
		..	..	..	..	..	..	201-204	R.	32, 33a, b, 34	..	+	..
		..	..	..	..	..	..	213	..	..	..	inc. 11-13	..
		..	..	..	..	..	..	Z. I. 2.0 g. 97	R.	..	1	Nil.	5 c.c. : +, inc. 8
		..	..	..	..	..	..	131	R.	..	1	Nil.	..
		..	..	..	..	..	..	153	G.	..	1	Nil.	..
		..	..	..	..	..	..	178	..	..	..	..	5 c.c. : nil.
		..	..	..	..	..	..	179	R.	..	1	Nil.	..
		..	..	..	..	..	..	200	R.	..	1	+	inc. ?
		..	..	..	..	..	..	219	..	..	..	..	5 c.c. : +, inc. 13
		..	..	..	..	..	..	221	R.	..	1	..	..

Trypanosomes: R.=rhodesiense; G.=gambiense. inc.=incubation. c.c.=cubic centimetres.

REMARKS

K. K.—The short incubation period suggests that the previous infection was established and dormant.
 Z. M.—135th-141st and 146th-148th day: inoculated with gland of 28 and 22a respectively. Trypanosomes first seen in Z. M.'s blood on 188th day; no symptoms from 148th-179th days; see text, "cryptic infections."
 Z. F.—171st day: inoculated with gland of 13. 252nd-253rd day: Ditto 21. 262nd-263rd day: Ditto 24. 320th-323rd day: Ditto 38 and 40. 365th day: Lumbar puncture; cells 4.5 per cm.
 Z. G.—120th-121st day: inoculated with gland of 18b. 149th-150th day: Ditto 22b.
 P. P.—223rd day: Acute general and local symptoms and trypanosomes 6 days after the blood inoculation. Probably also cryptic infection due to last fly-bite (see text).

G. G.—166th day: inoculated with gland of 8 and 9. 187th day: Ditto 3b.
 H. H.—224th-226th day: inoculated with gland of 18a and 26.
 Z. K.—Symptoms and trypanosomes on 219th day. See text discussion cryptic infections.
 Z. L.—152nd day: control clean volunteer also inoculated and infected after 12 days' incubation.
 Z. N.—153rd-156th day: inoculated with gland 18d, 19. 180th day: Ditto 22c. 201st-204th day: inoculated with gland 31. Small painful swelling on area of fly-bites.
 Z. I.—Trypanosomes first found in Z. I.'s blood on 233rd day; see text, discussion on cryptic infections.

SUMMARY OF THE INFORMATION CONVEYED BY TABLE II

(1) Nine volunteers received a single dose of 1.0 g. Bayer 205; five others a single dose of 2.0 g.; and four others two doses of 1.0 g. each, separated

by an interval of 21 days. All injections were given intravenously.

(2) Of those receiving 1.0 g., four were infected at their first exposure, 92, 105, 92, and 73 days after the administration of the drug, two falling to

T. gambiense and two to *T. rhodesiense*. The remaining five were protected for 120, 123, 97, 190, and 327 days respectively. Against *T. gambiense* the minimal periods of protection were 120, 111, and 97 days, and against *T. rhodesiense* 123, 73, 327, and 190 days. It must however be realised that as most of the later exposures were carried out with *T. rhodesiense*, the majority of the figures for *T. gambiense* are very conservative estimates.

(3) Of those receiving 1.0+1.0 g. none were infected at their first exposure. Protection against *T. gambiense* lasted 169 and 187 days, and against *T. rhodesiense* 171, 206, and 164 days.

(4) Of those receiving 2.0 g. none were infected at their first exposure. Protection against *T. gambiense* lasted 128 and 153 days, and against *T. rhodesiense* 163, 103, 152, 180 and 179 days.

(5) No more evidence has been secured about the relative effect of Bayer 205 on each of the two human trypanosomes, because, owing to lack of flies carrying *T. gambiense*, most of the later exposures were made with *T. rhodesiense*.

(6) As a general rule when infection did ensue it developed normally. There were however certainly three and possibly five examples of delayed or "cryptic" infection (volunteers Z. K., Z. I., Z. M., P. P., and K. K.) which are discussed below.

(7) The Table affords some support of the belief that 2.0 g. of Bayer 205 confers greater protection than 1.0 g.

(8) The most arresting result is the protection conferred upon volunteer Z. F., who was exposed to a long succession of gland-infected flies carrying *T. rhodesiense*, several of which had actually been proved to be infective to man, and all carrying strains known to be strongly pathogenic.

The single fly (41 of Table II.) which bit this man on the 327th day, had infected a clean volunteer a few days previously. The fly was dissected a few hours after biting Z. F. and was full of his blood; its glands were swarming with trypanosomes. On the day before trypanosomes appeared in Z. F.'s blood, lumbar puncture was performed. A perfectly clear fluid emerged under very slightly increased pressure. Examined by the Ross-Jones test the fluid contained no excess of globulin; and the lymphocyte count was 4.5 per c.mm. On the following day, the 16th after his last exposure, Z. F. complained of headache, his temperature was 99.5° F. and trypanosomes were found in his blood. This was the first occasion in his long experimental service that Z. F. complained of any symptoms. The condition of the cerebro-spinal fluid and the subinoculations of his blood into monkeys show that he had in truth escaped infection until the last subcutaneous inoculation.

An experiment was carried out to determine whether Z. F.'s blood possessed any action against *T. rhodesiense*.

Eight white rats were inoculated on Sept. 6th, 1935, with 0.25 c.cm. citrated blood of a monkey infected with *T. rhodesiense*. Trypanosomes appeared in the peripheral blood of all the rats on Sept. 10th. On the 12th three of the rats (weighing respectively 184, 217, and 207 g.) received a subcutaneous inoculation of 0.5 c.cm. serum of a normal European; three others (weighing 184, 190, and 169 g.) received 0.5 c.cm. serum of Z. F., 321 days after his injection of Bayer 205; and the remaining two (weighing 167 and 165 g.) were kept as controls. No apparent effect was produced by either serum on the number of trypanosomes appearing daily in the peripheral blood or on the duration of the disease. The European serum rats died on Oct. 7th, 11th, and 17th; those receiving Z. F.'s serum on Oct. 2nd, 7th, and 14th; and the two controls on Oct. 8th. As the untreated disease lasted for 32 days in rats, it is considered these limited observations

reveal no difference in the protective power of the two human sera tested.

General Discussion

MODE OF INFECTION AND STRENGTH OF INOCULUM

It has not been possible during this research to learn anything definite about the significance of the number of trypanosomes introduced or to contrast the two methods of infection. We know now that a single fly can infect man with either *T. gambiense* or *T. rhodesiense*, and it is highly probable that this is the way he ordinarily becomes infected in nature. Certainly it is extremely unlikely that anyone will be so unfortunate as to be bitten simultaneously by three or four gland-infected flies as were several of the volunteers on several occasions during these experiments.

Various observers have examined this question using the blood forms of the trypanosome, the most recent being Corson, who decided that the number of trypanosomes in the inoculum makes very little if any difference to the result (Corson (c)). The opinion of the volunteers themselves is that the syringe is the more deadly of the two modes of infection, but they are no doubt biased by the greater local discomfort it causes. Some of the "arms" that followed subcutaneous injection were really impressive, as also was the rapidity with which the local inflammation disappeared with trypanocidal treatment.

Unfortunately, it is impossible to compare the two methods of infection in the same subject, and I can only reiterate my belief that the inoculation of 1 c.cm. of citrated blood containing say from 1-3 trypanosomes per microscopic field ($\frac{1}{2}$ obj. \times 2 oc.) is a more severe test than the bite of a single fly infective with the same strain.

CRYPTIC INFECTIONS

In Table II. there are four instances of what may be described as cryptic infections among these volunteers—i.e., P. P., Z. I., Z. K., and Z. M.—and K. K. is possibly another example. With volunteer P. P. it is true the evidence is not absolutely conclusive. This man developed typical symptoms of infection 6 days after an injection into his forearm of blood infected with *T. rhodesiense*. On the third day after this inoculation, the arm being then considerably swollen, a small tender swelling appeared on his leg, on the area of skin where the last batch of infective flies had bitten him 21 days before.

Now a small tender swelling at the bite of an infective fly is not an uncommon symptom in volunteers infected by this method. The appearance of this swelling, therefore, together with the short period (6 days) elapsing between the injection of the blood and onset of symptoms, suggest that there was an undetected focus of living trypanosomes persisting at the site of the fly-bite and that this focus lit up during the general disturbance caused by the subsequent injection of infected blood. In support of this conclusion is the fact that in a control untreated volunteer who was inoculated simultaneously from the same inoculum as P. P., the first symptoms did not develop until the 15th day after inoculation. Volunteer K. K. is possibly another instance of the same kind. Volunteer P. P. when treated with Bayer 205 reacted in a typical manner, the temperature rising to 106° F. after the first injection and falling to normal within 36 hours. K. K., infected with *T. gambiense* and treated with trypanamide, exhibited a very mild febrile reaction

during his treatment, 101° F. being the highest recorded.

Trypanosomes were first found in Z. I.'s blood 33 days after his infection with blood containing *T. rhodesiense*; he denied feeling indisposed at any time and his temperature when the "positive" slides were taken was normal. His blood infected a monkey 19 days after his own infection. In this case, also, a second inoculation of *T. rhodesiense* was made before the original infection was diagnosed—i.e., 21 days later. When admitted to hospital this man's temperature remained for 48 hours between subnormal and 99° F. before treatment. After the first two injections of Bayer 205 (which produced no rise) the temperature remained normal for 7 days, rising for a few hours to 101° F. after the third injection, after which no further rise occurred.

The other two cases were more definite.

Volunteer Z. K. was inoculated with blood containing *T. rhodesiense* on two occasions after his actual infection with *T. gambiense* and before that infection had been diagnosed, the dates of the three inoculations being: *T. gambiense* on July 19th, 1935, and *T. rhodesiense* on August 12th (afternoon) and Sept. 9th. He first showed the characteristic early symptoms of trypanosomiasis on Sept. 20th, 11 days after the last inoculation of *T. rhodesiense* and two months after his inoculation with *T. gambiense*. His blood infected a clean monkey on August 12th (morning) and again on Sept. 3rd, on both occasions with *T. gambiense*; but until Sept. 20th he denied feeling any discomfort whatever. On admission into hospital his temperature was 102° F., and 12 hours after the first injection of Bayer 205 reached 105° F., dropping to normal 12 hours later. On the fifth and sixth days it rose to 99° F., tryparsamide was administered, and no further rise occurred.

Volunteer Z. M. was bitten by several gland-infected flies carrying *T. rhodesiense* between August 1st and 14th. He remained apparently in perfect health until Sept. 21st, when on close questioning he admitted a slight headache overnight. Trypanosomes were found in stained thick films of his blood on Sept. 23rd, and his temperature (taken four-hourly) during the ensuing 48 hours twice rose from normal to 99° F. On Sept. 9th and 16th his blood infected clean monkeys with *T. rhodesiense*. During his first two days in hospital his temperature reached 99° F. twice; the first two doses of Bayer 205 produced no further rise, but on the seventh day 101° F. was recorded for a few hours.

The trypanosomes isolated from both Z. K. and Z. M. were found to be readily transmissible by *G. palpalis*.

To balance the impression made by these cases, in all of which Bayer 205 may possibly have played in part, an example must be cited from another investigation. A similar kind of infection occurred in a volunteer (O.) who had been experimentally infected some 20 months previously with *T. rhodesiense* and treated in the usual way with Bayer 205, the last dose being given on Dec. 6th, 1933.

His temperature reaction on that occasion showed the typical rise to 105° F. after the first dose and then a rapid drop to normal. On August 7th, 1935, 610 days after the last dose of his course of Bayer 205, this man was inoculated with the blood of a guinea-pig infected with a strain of *T. rhodesiense* known to be of uncertain pathogenicity to man.

Two other adequately controlled injections of this strain into normal and untreated volunteers had failed, and in this man an entirely symptomless infection was revealed by an inoculation of his blood into a clean monkey on August 29th, 22 days after his exposure.

In the course of daily examinations of stained thick films of the blood of this monkey, trypanosomes were found first on Sept. 19th, 1935, and were subsequently diagnosed as *T. rhodesiense*. On Sept. 9th, still claiming to be in perfect health and his infection still undetected, the man

received another inoculation of same strain, this time from a monkey. On the 18th his blood again infected a clean monkey with *T. rhodesiense*, the incubation period in the monkey being nine days. Thick stained films of the man's blood were taken and examined on Sept. 23rd, 24th, 25th, 26th, and on the 27th very scarce trypanosomes were seen for the first time, and again on succeeding days until treatment was started. His temperature, taken twice daily, first rose above normal on Oct. 3rd, and his health according to his repeated asseverations remained excellent until that date, when he was taken into hospital. On admission he registered 99° F., and after the first injection of Bayer 205 the temperature was 99.6° F. and thenceforward normal.

The fact that the strain of trypanosomes responsible for this man's infection had already completely failed to infect 2 virgin volunteers shows that his previous infection and its treatment with Bayer 205 had left no trace of protection against his subsequent infection twenty months later.

This case shows that cryptic infection of man is not solely dependent on Bayer 205, but that it may arise also from the interaction between the natural resistance of the individual and the invading trypanosome. Cryptic infection must in fact be recognised as one of the forms assumed by human trypanosomiasis, and may occur with both of man's trypanosomes.

It was deemed unjustifiable to postpone treatment of these 3 men in order to watch the course of events. All 6 (Z. K., Z. M., P. P., K. K., Z. I., and O.) responded readily to treatment, there being no suspicion of drug-resistance in the trypanosomes in their blood.

CONDITIONS FOR DEVELOPMENT OF CRYPTIC INFECTIONS

The employment of volunteers on a large scale has thrown new light on certain phases of the early stages of trypanosome infections in man. The possibility of the occurrence of cryptic infections in man has long been debated, and Duren and Van den Branden (1934) have recently described two cases of *T. gambiense* of this nature in Europeans, one of which is peculiarly significant. The patient, who had quitted Africa 18 months previously, consulted the authors, complaining of mild lassitude and tachycardia—nothing more. Trypanosomes were found in his lymph and blood, and he responded immediately to ordinary treatment. This case is of course still more striking than those described above, although details of the original infection were not available.

The evidence afforded by the host's subjective sensations in cases of this kind can of course only be obtained from man, and should be useful in studying trypanosome infections in resistant animals generally. All the volunteers were on full duty during the whole period of the development of their infections, and their repeated denial of any sign of discomfort was at first a very puzzling feature.

Strangeways (1935) has noted that in mice *T. gambiense*, after a brief period when trypanosomes are discernible in the peripheral blood, may remain latent in the region of the choroid plexus for many months without producing any apparent effect on the animal's well-being. Corson (a) has described a somewhat similar infection produced by a feebly pathogenic strain of *T. brucei* in a white rat. It is of course possible that some of the cryptic cases described above would if left alone have remained without obvious symptoms for months, during which time serious involvement of the central nervous system might take place.

In 4 of the 5 cases cited in the present paper the progress of the disease was obscured by later infections superimposed before a diagnosis had been made. On the other hand, in most of the protected volunteers infection, when it did ensue, speedily manifested itself. In the case of Z. F., the incubation period was 16 days and the onset typical.

Whether a cryptic infection develops or not will depend partly on the trypanosome and partly on the resistance of the individual. A virulent strain will doubtless soon declare itself; an avirulent may not. Typical virulent *T. rhodesiense* is unlikely to remain hidden for long; *T. gambiense* is often mild in man in many parts of Africa, and so is more likely to be overlooked. But this gap between the two organisms is lessened by the knowledge that *T. rhodesiense* is prone to lose its full virulence for man. Volunteer O. was infected by just such a strain.

The age, condition, and natural resistance of the individual will also play a part, and so will the frequency of exposure to reinfection; for it is highly probable that persons protected by Bayer 205 owe some and possibly a great deal of their immunity to the repeated inoculation and destruction of living trypanosomes within their tissues. This same process of repeated inoculation will take place in natives undergoing prophylaxis in an infected area; indeed, the more unhealthy the environment the greater presumably will be the immunisation of those protected.

There is good reason to believe that the resistance of both ruminants and man to trypanosomes depends to a considerable extent on the general well-being of the host. Years ago Roubaud (1921) drew attention to this factor in connexion with protozoal infections of man, and of late years it is becoming more and more widely recognised as of very great practical importance. Dumont (1935) has assembled the opinions of experienced observers in sleeping-sickness territories in the French African possessions, all of which emphasise the importance of the standard of living in determining the spread of the disease. At the Conference on Sleeping Sickness held at Entebbe in 1933 the improvement of the conditions of living among the native tribes in Eastern Africa was unanimously recommended as an essential part of any campaign against sleeping sickness. Any scheme of drug prophylaxis against infection should therefore be accompanied by a serious attempt to raise the standards of living of the exposed population, whose normal dietary is as a rule far from balanced according to modern ideas.

How these cryptic infections arise it is difficult to explain. They may be due to the trypanosome itself being in some way weakened by the drug (we have seen that this will not cover all such cases) or to the host's resistance being increased to a point where the trypanosome is restrained from exerting its normal action. The fact that most of the protected volunteers eventually developed ordinary symptoms shows that the virulence of the trypanosome undergoes no permanent change. On the other hand, the prolonged resistance shown by volunteer Z. F. can scarcely be due alone to the direct effects of the original 1.0 g. of Bayer 205 on each fresh consignment of metacyclic trypanosomes introduced at intervals over a period of some eleven months. His behaviour suggests rather that immunity is acquired from repeated "vaccinations" with living antigen, the immunisation beginning while the drug is still actively trypanocidal in the patient's tissues. Kligler and Weitzman (1926) found that repeated inoculation

of rabbits with dead trypanosomes induced hypersensitisation, whereas if the animals were inoculated with trypanosomes suspended in Bayer 205 definite resistance was produced. The same might occur in the protected subject during the first few weeks after the administration of the prophylactic.

It is almost certain that this obscure kind of infection will be overlooked in any ordinary examination of a native population for trypanosomiasis. For without gland enlargement or fever or malaise of some kind, and with a "negative" blood slide, there is little chance of a diagnosis being made. Cases of this nature could do much harm in spreading the disease.

APPLICATION OF BAYER 205

Does the prospect of cryptic cases constitute a vital objection to the use of Bayer 205 as a prophylactic? My own opinion is that it does not. Two seemingly good reasons are first that these cases are readily amenable to treatment, and secondly that they occur where no Bayer 205 has been used. The knowledge that they may occur will help, too, in their detection. When protection is needed for persons entering an infected area for some definite and limited undertaking, Bayer 205 should certainly be employed, the dose being repeated at intervals, say, of three months.

A more difficult problem is the protection of the indigenous population of a sleeping sickness area. I believe that here too Bayer 205, if employed under careful supervision and with the intelligent coöperation of the population itself, will be of great value. It should be borne in mind that *T. gambiense* is more likely to evade detection than *T. rhodesiense*.

Where the conditions in an infected area are such that the disease persists unchecked by clearing and other local control measures, then Bayer 205 should prove a valuable aid, if applied at regular intervals and to a population adequately supervised. To every inoculated individual protection will be conferred for two months at least, and in some for much longer. Of those whose period of protection is allowed to lapse, only a minority will develop cryptic infections; the majority, according to the experiments of this paper, will show the ordinary symptoms of the disease. Moreover, cryptic infections will be encountered apart from any system of prophylaxis.

There is little doubt that *T. gambiense* in many infected areas is spread by a comparatively small number of infective flies, any one of which may however be responsible for 30-40 cases during its life-time. Under these conditions the protection of the exposed population for a period of two or three months—during which time infected flies are dying out—will surely help enormously in checking the spread of the trypanosome.

In *T. rhodesiense* areas, where game animals can maintain for considerable periods strains pathogenic to man, this indirect effect of Bayer 205 will be less noticeable. But here also man is in the long run the main reservoir for human strains, and anything that reduces his susceptibility will be of ultimate value in controlling the disease.

To the medical man in Africa there is still something mysterious about the action of Bayer 205 and its curious potency against man's trypanosomes, and this may explain to some extent the rather vague fears entertained in certain quarters about its use as a prophylactic on a large scale. Dr. Van Hoof, however, informs me by letter that the results obtained with Bayer 205 and *T. gambiense* in the vast infected areas of the Belgian Congo suggest the

need for circumspection in the employment of the drug, and his figures will be awaited with great interest.

With increasing confidence, inspired by the knowledge that for three months at least the majority of those inoculated are safe, both the administrator and the native himself will find a way to that genuine coöperation which is so essential to success in this particular problem. Once freed from the dreaded old-time consequences of detection as a sufferer—removal to a distant hospital, wholesale evacuation of the homeland, and all the well-remembered restrictions and dislocations imposed in the days of our comparative ignorance and inexperience—the native will willingly come to the help of the authorities by searching out and reporting early cases of the disease, and coöperating to the full in any local measures that may be prescribed.

Conclusions

(1) A dose of 2.0 g. of Bayer 205 administered to an adult may be expected to confer protection against *T. gambiense* and *T. rhodesiense* for at least three months. The protection may last much longer.

(2) One volunteer (Z. F.) resisted infection by tsetse for 327 days after he had received 1.0 g. of Bayer 205.

(3) In a proportion of those protected by Bayer 205 and exposed to infection with human trypanosomes, infection when it does at length occur may be of a cryptic type, the patient showing no apparent symptoms for two months and possibly longer. An infection of this kind may gradually generate typical symptoms or it may become merged into a subsequent infection superimposed upon it and running a normal course. Cryptic infection can however arise independently in nature, apart altogether from the administration of any drug.

(4) A consideration of the behaviour of the volunteer Z. F. suggests that frequently repeated inoculations of living trypanosomes during the three or four months immediately following the administration of Bayer 205 lead to the establishment of a more prolonged immunity than that conferred by the drug alone without such frequent exposures to infection. If this is true, then the more intense the exposure in nature to infective tsetse the greater the benefit derived from the prophylactic.

Dr. W. H. Kauntze, director of medical services, Uganda Protectorate, has helped in a variety of ways by placing at my disposal his advice and the resources of his department. To Dr. J. Black and his colleague, Mr. Barkat Singh, of the Medical Department, Entebbe, I am indebted for continuous help throughout this research. All preliminary examinations and all treatment of the volunteers were carried out by these two officers. That no mishap of any kind has occurred is a tribute to their care and skill.

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THE ANTAGONISM BETWEEN CURARINE AND PROSTIGMIN AND ITS RELATION TO THE MYASTHENIA PROBLEM

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THE beneficial effect obtained in cases of myasthenia gravis by injection of prostigmin, reported by Dr. Mary Walker¹ and confirmed by other workers, has centred attention on the pharmacological mode of action of this drug, an analogue of eserine.* The reasons which led to this important observation were the resemblance between myasthenia and mild curare poisoning and the well-known antagonism between eserine and curare. Blake Pritchard^{2,3} has made advances by showing (1) that the form of the myogram in myasthenics differs markedly from the normal, showing quick fatigue with high rates of stimulation, and (2) that prostigmin restores the myogram to the normal form while simultaneously restoring the patient's strength.

The object of the present paper is to show that a parallel observation can be made experimentally. The myogram of the cat's quadriceps, showing quick fatigue under mild curarisation, can be restored to normal by a large dose of prostigmin such as would cause acute depression in fresh unpoisoned muscle. Some observations on the peripheral effects of (1) prostigmin alone, and (2) varying doses of curarine and prostigmin together will be given which suggest an explanation of this paradoxical effect. Details of technique have been given in other publications.⁴ The nerve-muscle preparation has been the quadriceps of the cat with circulation intact, and the movement of extension of the knee has been recorded. The cut nerve has been stimulated by neon lamp discharges which can be readily altered, both in strength and frequency.⁵

Control myograms are first taken, showing the responses to short spells (1-2 secs.) of different rates and strengths of stimuli. A small dose of curarine chloride is then injected intravenously. In a few minutes the contraction caused by the fast rate is not maintained as in the control but rapidly gives way. The myogram closely resembles that seen in myasthenics in response to fast rates. At this point a large dose of prostigmin (1 c.cm. for a 3-kilo. cat, preceded by atropine) is given intramuscularly. In a few minutes the myogram improves and returns to the normal (Fig. 1). Control experiments show that recovery due to gradual elimination of curarine would take an hour or more.

An indication of the mode of action of this antagonism is found by studying the peripheral actions of prostigmin and curarine separately in fresh unpoisoned muscle. The two factors in the myogram affected by these drugs are (1) height of contraction, (2) maintenance of the same.

THE ACTION OF PROSTIGMIN ALONE

Prostigmin in the large dose indicated produced marked and characteristic effect.

Five rates of stimulation (30, 50, 75, 105, and sec.) at submaximal and supramaximal strer

* Prostigmin was used in these experiments because it has been extensively employed clinically. Eserine has given experimental results. There is no reason to suppose that prostigmin has any particular advantage over the substance eserine.

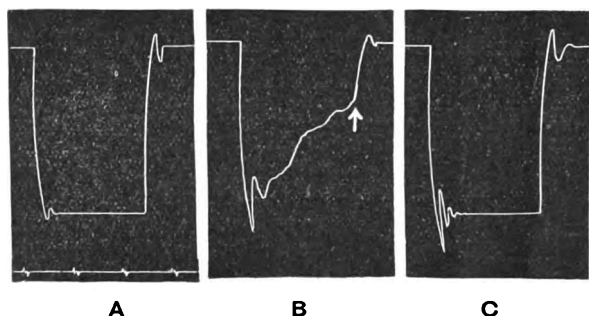


FIG. 1.—Cat, 2.9 kg.; quadriceps. Time in seconds. Contraction is downwards in all tracings. Rate of stimulation, 150 per sec. Strength, just under maximal. (A) Control curve of normal muscle. (B) Same stimulus. Mild curarisation, 0.25 mg. per kg. intravenously. Tension not maintained. Arrow indicates cessation of stimulus. (C) Fourteen minutes after injection of 1 c.c.m. prostigmin intramuscularly preceded by atropine 2 mg. Tension maintained. Improvement in contraction was noticed four minutes after injection.

tested. Controls show that fast rates produce larger contractions than slow ones. Sometimes rates 105 and 150 per sec. produce contractions of equal size.

A few minutes after the intramuscular injection of prostigmin a progressive change is seen in both the size and shape of the myograms. The response to the fastest rate with strong stimuli is most affected, being both diminished in size and less well maintained, until eventually at the end of 10 to 20 minutes it is smaller than the response to the slowest rate and is twitch-like in character (Fig. 2). At the height of the depression, rate 75 per sec. usually produces the largest contraction and rate 150 the smallest.^{6, 7} This alteration in relative size of contraction is seen both with submaximal and supramaximal stimulation.

A third characteristic change is seen in prostigmin and eserine poisoning, but not with curarine. It is a modification of the initial curve of contraction which affects all responses. Normally the leg rises to full extension in one movement. After prostigmin with slow rate stimulation the movement is interrupted by a temporary falling back, after which the movement of extension is resumed. In cases of mild poisoning this jerk may not be more than an accentuation of the backswing which is often seen when a heavy limb is thrown suddenly into full extension by a supramaximal stimulus. In deep poisoning with fast rates of stimulation there is no recovery from this early depression and the response therefore becomes twitch-like. The myograms show that with all rates of stimuli the first movement of extension is alike, but the recovery from "inhibition" is swift in the slow rate responses. Extension therefore can still be maintained. These changes are more pronounced with a greater degree of poisoning. With weak submaximal stimuli similar changes may be seen, but the interruption occurs earlier in the curve of contraction (Fig. 3). During elimination of the drug the notch gradually disappears, until eventually the myograms show as smooth a curve as the controls. To sum up, there is in prostigmin poisoning a progressive deterioration affecting both the size and maintenance of contraction which is marked in the responses to the faster rates of maximal stimulation.

Signs of recovery from prostigmin poisoning appear within an hour of administration. Recovery is gradual and the effect of the drug is maintained for several hours. Recovery is complete when the fastest rate produces the largest contraction, which holds for a period of at least 15 minutes without loss of tension.

THE ACTION OF CURARINE ALONE

The peripheral action of non-paralytic doses of curare is well known. Bremer and Titeca⁸ have shown that contraction is not maintained whatever the rate of stimulation—i.e., 10 or 70 per sec. These observations have been confirmed.⁹

The point to be noted in responses to different rates after moderate doses of curarine (0.3 mg. per kilo) is that there is no fundamental change in the sizes of the contractions relative to each other. As in the control series the faster rates produce the larger contractions; that is, normal order is retained, though all the contractions are reduced in size and are twitch-like in character (Fig. 2 c). This is in direct contrast to the condition following prostigmin poisoning.

THE ANTAGONISM OF PROSTIGMIN TO CURARINE

If curarine be given in doses which cause temporary paralysis a large dose of prostigmin will halve (approximately) the time of recovery. For instance, a moderate dose of curarine produced in 12 minutes a paralysis which lasted for 4 minutes, after which small twitches reappeared. In 40 minutes recovery

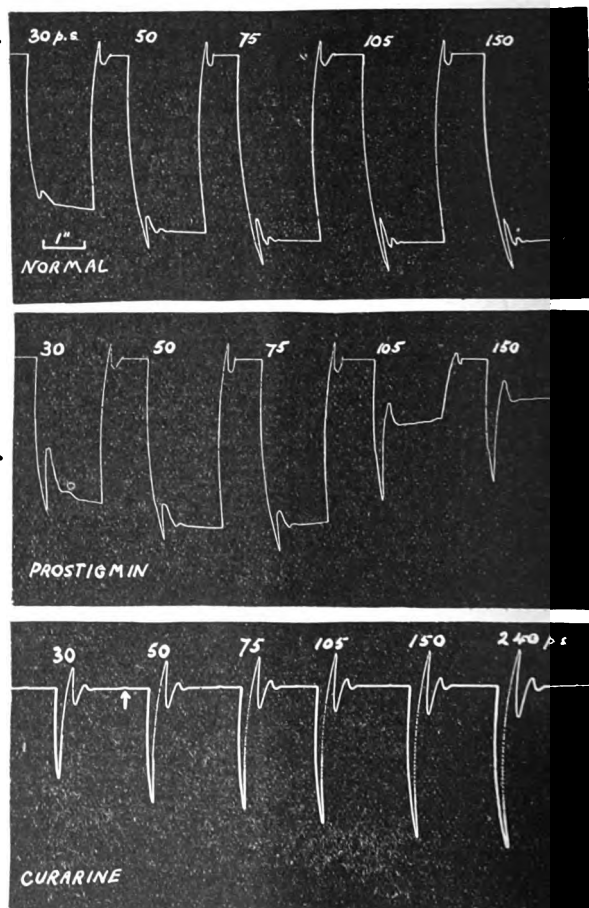


FIG. 2.—Quadriceps. All stimuli supramaximal (double just maximal strength). (A) Controls. Five responses to different rates of stimuli. Rate 30 per sec. produces smallest contraction and rates 105 and 150 the largest. Controls were also taken in reverse and random order. (B) Same stimuli, after prostigmin. Rate 75 produces largest contraction and rate 150 the smallest with rapid loss of tension. Response to rate 30 shows brief relaxation followed by recovery. (C) Another preparation. Twitch-like responses to all rates after curarine. Stimulation continued for at least one second. Arrow shows cessation of stimulus. Contractions larger with increases of rate.

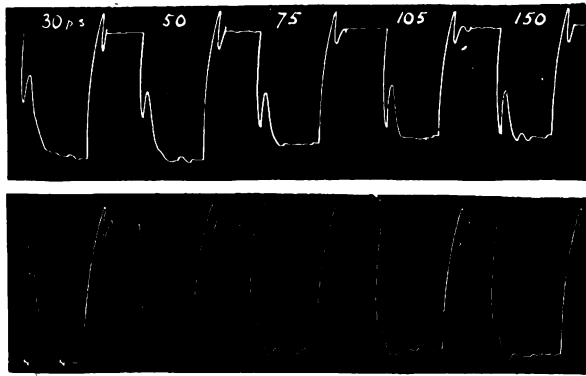


FIG. 3.—Quadriceps. Submaximal stimulation. Control contractions showed smooth curves and increase of size with increase of rate. Time, one second. *Upper row*: Submaximal responses during recovery from deep prostigmin poisoning, injection 25 minutes earlier. Slower rates produce larger contractions. Well-marked notch in all tracings and coarse tremor. *Lower row*: Same stimuli. Ten minutes later, notch less well marked. Slowest rate produces smallest contraction. Two hours after injection curves were as smooth as in controls and rates 30 and 50 gave smaller contractions than the three faster rates. Supramaximal fast rate responses still showed some depression.

was still incomplete—i.e., a slow rate of 30 per sec. could just maintain a contraction for 5 seconds without sign of failure. At this point a second similar dose of curarine was given which caused paralysis in 1 minute. Atropine and prostigmin were now injected and a similar stage of recovery was reached in 23 minutes—i.e., a stimulus of slow rate maintained a contraction for 5 seconds.

It has already been shown (Fig. 1) that the quick fatigue produced by mild curarisation can be restored to normal by an injection of prostigmin. It is remarkable that this antidotal action which restores responses to all five rates is secured by giving poisonous doses of prostigmin such as would cause, in normal muscle, the marked depressant effects illustrated in Fig. 2B. There may be no sign of characteristic prostigmin depression. Contractions have been recorded, showing normal curves, for a period of over four hours after injection of the drug. When the initial dose of curarine was smaller, slight signs of prostigmin effect could be detected about an hour after injection of the antidotal large dose in that response to rate 150 was smaller than response to rate 105.

ANTAGONISM OF CURARINE TO PROSTIGMIN

When an animal deeply affected by prostigmin receives a dose of curarine (0.3 mg. per kilo) capable

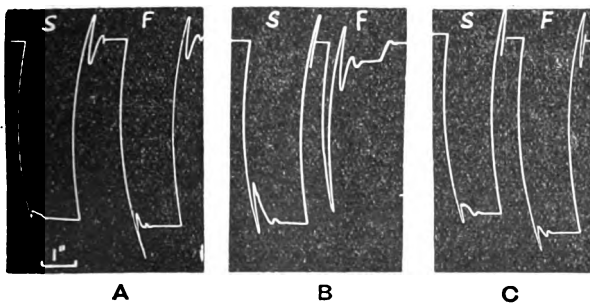


FIG. 4.—Quadriceps. Stimuli supramaximal in strength. (A) Normal responses to rates, 30 and 150 per sec. 12.8 P.M. Prostigmin, 1 c.cm. (B) 12.39 P.M. Slow rate response shows temporary relaxation and recovery. Fast rate response is twitch-like and smaller. 12.40 P.M. Curarine, 0.3 mg. per kg. (C) 12.41 P.M. Both responses nearly normal.

of producing in the normal animal twitch-like responses to all rates a striking antagonistic effect is seen. The small twitch-like responses to the fast rate (150 per sec.) are suddenly improved, they show less depression and become larger than responses produced by the slow rate stimuli (30 per sec.). This result occurs in less than a minute (Figs. 4 and 5).

If the doses are fortunately balanced there may be an almost complete restoration to the normal and the notch disappears from submaximal contractions. Usually the restoration is incomplete and does not last long. In a few minutes the characteristic curarine effect becomes predominant. All the myograms show depression but normal grading is resumed in that the faster rates produce larger contractions. The presence of prostigmin, however, diminishes the degree of depression produced by the curarine.

If a smaller dose of curarine (0.15 mg. per kilo) be given, the antagonistic effect may show itself only

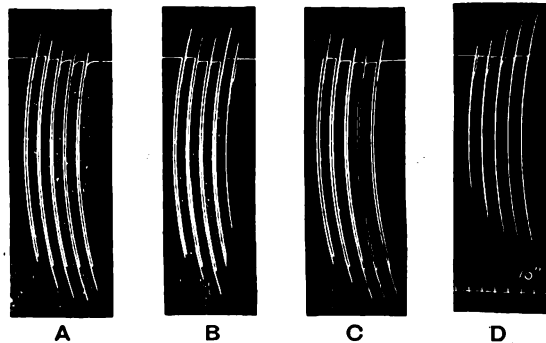


FIG. 5.—Records taken on slow rate of drum. Two-second spells of supramaximal stimuli every ten seconds. Rate raised between each spell (30, 50, 75, 105, 150 per sec.). All taken in same sequence. (A) Before prostigmin. Rate 30, smallest contraction. (B) After prostigmin. Rate 150, smallest contraction and twitch-like. (C) Two minutes after intravenous injection of curarine, 0.3 mg. per kg. Curves nearly restored to normal. Little curarine effect developed, so 0.3 mg. per kg. curarine was given one and a half hours later. (D) Eight minutes after second dose. Typical curarine effect. All contractions are twitch-like and faster rates give larger contractions.

by reducing the time of recovery from prostigmin poisoning from several hours to one hour—i.e., there is a complete absence of curarine depression.

Discussion

The work of Loewi, Dale, and many others has brought great support to the theory of a chemical transmitter of excitation between nerve-ending and effector organ.¹⁰ It is known that eserine delays the normal swift destruction of this transmitter by the esterase in the blood, thus causing accumulations. The present experiments indicate that such accumulations are capable of causing depressant effects in normal muscle contractions. Can the paradoxical effect of prostigmin—depressing function in unpoisoned muscle restoring function in curarised muscle—be explained on this theory?

Two different solutions can be offered. The first supposes that the fault in curarine poisoning and in myasthenia gravis lies in the too rapid destruction (or insufficient production) of transmitter. This fault in both cases would be rectified by the delaying action of prostigmin on the destruction of the transmitter and normal contractions would follow. Conversely, in muscle poisoned by prostigmin the delay in destruction of transmitter would be counterbalanced by the

speeding-up action of curarine. The second explanation, suggested to me by Sir Henry Dale, is that curarine counteracts the depressant effects of prostigmin not by affecting the output or stability of the transmitter but by raising the threshold for its depressant action when excess is present. On the other hand, if curarine raises the threshold for stimulation, prostigmin would counteract the depressant effect of curarine by increasing the amount of transmitter which would enable the obstacle of raised threshold to be overcome. An observation has been made by Dale and his associates which is in favour of the latter suggestion. They have shown that there is no obvious fall in the amount of transmitter, identified by them as acetylcholine, in the venous effluent of an eserinated muscle whose contraction has been blocked by curarine. It is not possible at present to decide between the alternative theories.

That the depressant effects in prostigmin and curarine poisoning respectively are not identical in origin is suggested by a comparison of the myograms resulting from different rates of stimulation. Although twitch-like responses are obtained with both drugs in myograms from the fast rate, a marked difference occurs with the slower rates. Under curarine each contraction, whether with slow or fast stimulation, starts normally and then fails at once. With deficiency of transmitter or rise of threshold there is no reason why the relative sizes of the contractions should be disturbed. Under prostigmin the fast rates produce contractions which are deficient in size and power of maintenance, but the slow rate myograms are less affected. It is difficult to explain this result unless it be accepted that excess of transmitter can "blanket" contractions when high rates and strong stimuli are accentuating such excess. The notching in the initial curve of contraction is also difficult to explain. It may be due to a kind of "adaptation" to excess of transmitter, which in the fast rate myograms does not have time to show itself.

It is clear from these experimental findings that some balance, in relation either to the rate of destruction or to the threshold, has to be preserved if the nerve-muscle unit is to function efficiently. This balance can be readily upset or restored by either of the drugs studied. Recent work by Cowan¹¹ indicates that neither nerve trunk nor muscle-fibre is affected by prostigmin, so that by exclusion the site of its action must be the neuromuscular junction. This has long been recognised in the case of curare.

To apply these results to the problem of myasthenia: if this condition is really akin to curare poisoning either of the two solutions offered would explain the temporary alleviation procured by prostigmin. Stedman¹² has estimated the choline esterase of blood in (a) myasthenics, (b) normals. He found no excess of esterase in the first group. If it be accepted that the esterase content of the blood is a measure of its concentration in the tissues this piece of evidence is against the theory that the condition of myasthenia gravis is due to the excessive destruction of acetylcholine by the enzyme in the blood.

Summary

The peripheral actions of prostigmin and curarine have been studied separately showing that either is capable of producing acute depressant effects, which, however, are not identical. Their mutual antagonism is such that normal muscular action can be preserved when poisonous doses of the drugs are exhibited together. These results can be explained on the

theory of chemical transmission of excitation. Their application to the myasthenia problem is discussed.

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RÔLE OF ULTRA-VIOLET RAYS IN THE DEVELOPMENT OF CANCER PROVOKED BY THE SUN

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IN 1932, in a paper¹ on the part played by the sun's rays in the causation of skin epitheliomata, I pointed out that though this suggested aetiology has produced some very interesting communications, none of their authors (Dubreuilh, Gougerot, Larabi, &c.) has adequately explained the process by which the transformation to malignancy takes place.

My own first observations on this process were published in 1928,² when I drew attention to the high incidence in the Argentine Republic of cutaneous epitheliomata, localised exclusively on the face and on the back of the hands. Among 5000 cancer patients attending the Cancer Institute of Buenos Aires none showed cancer of any part of the skin covered by clothing (except in two or three cases where tumours developed on naevi or burn scars). The predilection of cutaneous cancer for regions exposed to the sun is shown by the following rates obtained at the Institute:—

EPITHELIOMA OF SKIN (1500 CASES)

(a) Regions exposed to the sun.		%	(b) Regions protected by clothing.		%
Skin, face	..	95.51	Hairy skin	..	1.02
Skin, back part of the hands	..	3.07	Foot	..	0.52

In the face the parts most often affected are those most prominent and exposed; for example, the nose bears 61 per cent. of the facial epitheliomata, compared with 18 per cent. on the cheek and hardly any on the forehead. It is also found that men are more receptive (70.9 per cent.) than women (29.1 per cent.), the lower incidence in women being related to the care they take of their skin, protecting it with powder. The few epitheliomata seen in females have been only in countrywomen and those of very humble standing who do not bother to protect their skin. The lesions develop both in workmen and in those of the higher social classes who have to expose themselves to the sun all day—e.g., farmers and planters. Sufferers from epithelioma are generally found to have very white (photosensitive) skins, and I have not seen a single case in natives, negroes or mulattoes. The patients have a peculiar aspect: the face up to the brim of the hat, and the hands up to the sleeves of the coat or shirt, present at first a diffuse erythema, and later numerous pigmented zones, which contrast with the white skin of the forehead and the forearm. These pigmented zones get more pronounced and hyperkeratotic; then they ulcerate

and become cancerous. These changes are associated with hypercholesterol of the tissues exposed to the sun, known as "cholesterol mask" and "cholesterol gloves."

The hyperkeratosis which leads on to the epithelioma is dominated by a photodynamic mechanism, and for fulfilment of the process the following factors are necessary: the living cell, a sensitising photodynamic substance, the presence of oxygen, and the rays of the sun. Consequently I ascribe great importance to a substance, cholesterol, which is always present in the living protoplasm, and plays an active part in cell development. Experiment has shown that it is present in excess in cancerous tissues, that it is heliotropic, and that it has photo-activity.³ Moreover we find that the parts of the face most exposed to the sun (nose) which develop the highest percentage of epitheliomata have also the highest content of cholesterol. This is seen from the following percentages based on 302 cases of facial skin cancer examined at the Institute:—

Incidence of epithelioma.		Cholesterol content of dried skin.	
	%		%
Nose	61.40	Nose	0.74
Cheek	18.00	Cheek	0.50
(Abdomen) ..	0.06	(Abdomen) ..	0.20

As a result of these observations, experiments have been undertaken which confirm the view I have outlined. In white rats I have obtained tumours of different histopathogenesis (epitheliomas and spindle-cell sarcomas) in unprotected parts of the skin (ears and ocular conjunctiva). These tumours have developed under the influence of the total sun rays or under ultra-violet rays with a wave-length of 1800-3400 Å. In animals, as in human beings, the skin is found to have an abnormally high cholesterol content before the development of the tumours. A summary of the experiments made on a series of 10 rats, with ultra-violet rays from a Hanau apparatus, is given below.

Three of the rats died from insolation, the experiments having been carried out in summer. When the temperature was very high, a ventilator was placed over the animals.

The period of exposure was gradually increased, the doses of ultra-violet rays being equal to the average of the sun units, measured with the dosimeter S.V. At first irradiation lasted 5 minutes; it was then increased and after fourteen days it had reached 1200 minutes daily. The longest test lasted nine months and five days. The rats were fed in the same way as the non-irradiated control animals, none of which developed cancer.

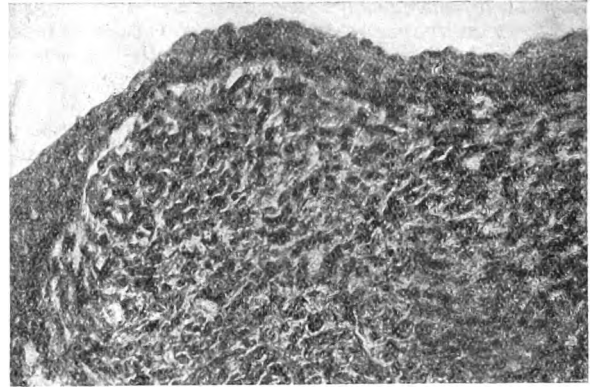


FIG. 1 (Rat 1).—Spindle-cell sarcoma of the conjunctiva of the eye, partly covered by Malpighian conjunctival epithelium.

The following Table summarises the results obtained.

Results of Ultra-violet Irradiation of Rats

Rat No.	Duration of the process in months and days.	Lesions provoked.
1	8 m. 13 d.	Enormous sarcoma of eye. Multiple lesions, papillomatosis, and hyperkeratosis of the ears.
2	8 m. 28 d.	Large cancrioid of left ear. Multiple lesions, papillomatosis, and hyperkeratosis. Spindle-cell sarcoma of right ear.
3	8 m. 20 d.	Enormous spindle-cell sarcoma of neck, previously shaved. Multiple hyperkeratotic lesions; papillomatosis of the ears. Voluminous cancrioid of left ear.
4	8 m. 12 d.	Large tumour of eye (spindle-cell sarcoma). Multiple formations on ears; hyperkeratosis, papillomatosis, and epitheliomata.
5	7 m. 6 d.	Large tumour of eye (spindle-cell sarcoma). Multiple formations on ears; hyperkeratosis and papillomatosis.
6	9 m.	
7	9 m. 5 d.	Enormous epithelioma formed on ear; multiple hyperkeratotic lesions and papillomatosis.

In looking for records of similar experiments I have found two papers by Findlay⁴ who has induced papillomata and epitheliomata in mice by exposing them to ultra-violet rays. But these animals had been artificially depilated with sodium sulphide. In a third paper Putschar and Holtz⁵ report having obtained epitheliomata of the ear, but they do not mention spindle-cell sarcoma.

The second part of my experiments was intended to elucidate the process by which the rays cause the cells to become cancerous. I regard this process as a vital phenomenon which can only take place in the presence of certain sensitising substances, which are activated by the sun's rays. My observations⁶ on cholesterol show it is increased in amount in the skin of

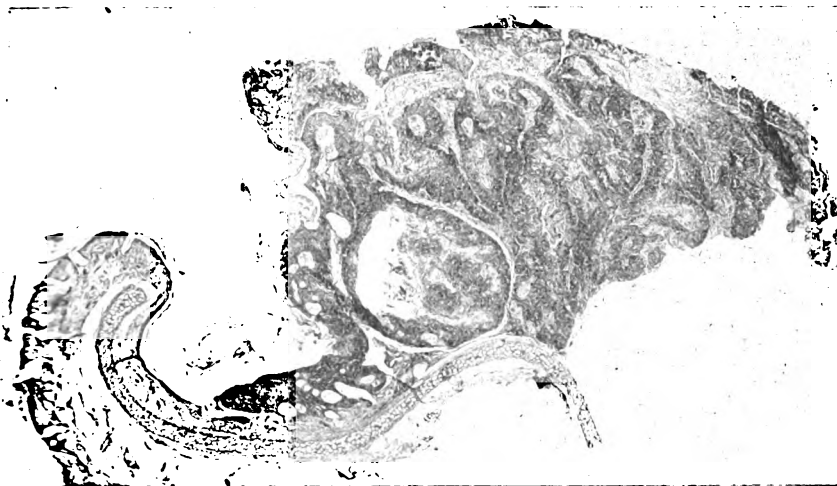


FIG. 2 (Rat 3).—Ear tumour. Highly anaplastic pavement carcinoma reaching down to the cartilage.

animals irradiated in certain regions, and they have been confirmed by Kawaguchi.⁷

In naturally hairless regions (ears) I have been able to demonstrate any excess of cholesterol in the skin before any of the histological changes of cancer could be detected. The increase in cholesterol of the irradiated ear in relation to the non-irradiated ear reaches a very high figure (1.5 g. %).

SUMMARY

It is clear that the rays of the sun and of the actinic spectrum will produce malignant tumours without the intervention of other agents. In rats the tumours are of epithelial type—epitheliomata with conspicuous anaplasia, and large sarcomata of the spindle-cell type—and they attain their largest size after seven to nine months. They grow in the regions naturally free from hair (ears and conjunctiva) or artificially depilated. The process begins with hyperplasia, hyperkeratosis, papillomatosis. The action of the rays is not specific for particular kinds of cells, for the epithelial cells and the conjunctiva respond in the same manner to the rays. The proportion of animals developing tumours is very high (all of 7 surviving rats), and in the same animal both sarcoma and epithelioma may be observed. The irradiation produces a local excess of cholesterol which can be detected before there are any histological changes. In view of the heliotropism and photo-activity of cholesterol I look upon its increase as highly significant.

ADDENDUM

Since this paper was written I have made further observations and I would like to add the following conclusions.

Exposure to the sun's rays is in itself sufficient to produce malignant tumours in 70 per cent. of rats and mice. The process takes 7-10 months passing through hyperplasia and papillomatosis, and the carcinomatous and sarcomatous animals alike die in a state of cachexia with metastases in lymph-glands. In the development of cancer in this way cholesterol plays an important part as a photo-active, heliotropic, and energising substance. Experiments performed with different sorts of rays (total sun, filtered sun, ultraviolet rays, luminous rays, neon gas, and short Hertzian waves) show that the power of the rays to produce tumours depends on their actinic and not on their luminous intensity. Histologically the lesions obtained closely resemble those observed in persons with photosensitive skins which have been much exposed to the sun, and these observations emphasise the danger of such exposure.

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ROYAL DEVON AND EXETER HOSPITAL.—There is a loss at this hospital of over £4000 on the year's working and the financial position is less satisfactory than for many years past. The cost of road accidents is large, while various internal improvements and a greater number of patients have also increased expenses. About 30 beds will shortly be added and it is essential that the number of annual subscribers should also grow.

GONADOTROPIC HORMONES IN THE TREATMENT OF STERILITY IN MAN

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It seems to have been clearly established that the normal descent of the testes into the scrotum is closely associated with the action of gonadotropic hormones. The recent clinical trial of such hormones in the treatment of delayed descent of the testes in man has resulted in an encouraging proportion of successes. The initiation and degree of spermatogenesis in animals also appears to be under hormonal control. Excision of the anterior lobe of the pituitary gland is known to be followed by cessation of spermatogenesis as well as atrophy of the accessory reproductive glands, and the return of spermatogenesis after implantation of anterior pituitary tissue has also been reported.

Schockhaert¹ has successfully used gonadotropic hormones to induce precocious spermatogenesis in birds, but the many attempts to influence the immature mammalian testis in the same way have given uncertain results, and clinical improvement following the administration of these hormones in the treatment of azoospermia or oligospermia in man has rarely been described. Brosius and Schaffer² record one case of azoospermia following mumps orchitis in which therapy with urinary gonadotropic hormones was followed by the production of motile spermatozoa; Brosius³ has also reported pregnancy after the use of these hormones in one case of deficient spermatogenesis in man. There are so few reports of this kind, however, that the following cases are likely to be of interest.

CASE 1.—Man aged 27. Married three years without children; no contraceptives had been used. On examination in November, 1932, his general condition was good, and his secondary sex characters normal except for lack of full development of adult male voice. He had suffered from mumps after puberty, but there had been no known orchitis. Both testes were smaller and softer than normal; the epididymes were thin and flaccid; the prostate gland was small; and the seminal vesicles could not be palpated. After detailed inquiry, sexual desire, potency, ejaculation, and orgasm were considered to be normal. The patient's wife had been seen by Mr. Frank Cook who had found no evidence of any disease or abnormality of the pelvic viscera.

A first specimen of semen was examined in December, 1932, 23 hours after coitus; the volume was 3.5 c.cm. and it contained 2 million spermatozoa per c.cm., none being motile. Films stained with iron hæmatoxylin and eosin showed 24 per cent. of abnormal spermatozoa. As only two days had elapsed since the previous coitus a further specimen, obtained after a longer interval, was examined in February, 1933. This specimen, which showed no motility 12 hours after production, contained 14 million spermatozoa per c.cm. Advice was given as regards sexual rest, open-air exercise, and increase of the protein and vitamin content of the diet. A third examination of the semen in May, 1933, gave a spermatozoa count of 22 millions per c.cm. and showed about 50 per cent. motile spermatozoa 14 hours after production.

Following this response a course of injections of a urinary gonadotropic hormone (Parke Davis and Co.'s Antuitrin S) was given at approximately weekly intervals, in doses equivalent to 100 rat units, for a period of four months. The last of these injections was given in December, 1933, and pregnancy of the wife was diagnosed in March, 1934. A final examination of the semen a few weeks later showed a high degree of motility 11 hours after production and the maintenance of motility of some spermatozoa up to

22 hours. The spermatozoa content of this specimen, which was 6 c.cm. in volume, was 69 million per c.cm. A differential count revealed abnormality of 8 per cent. A normal full-term child was born in October, 1934.

The main features of this case are set out in Table I.:

TABLE I.—*Examinations of Semen in Case 1*

Date.	Volume (c.cm.).	Hours before exam.	Motile spermatozoa.	Total sperm. (mill. per c.cm.).	Abnormal sperm. (per cent.).
Dec., 1932	3.5	23	Nil.	2	24
Feb., 1933	?	12	,,	14	?
TREATMENT DIRECTED TO EXERCISE AND DIET					
May, 1933	4	14	About 50%	22.5	17.5
TREATMENT WITH ANTUITRIN S. SEPT.—DEC., 1933					
Apr., 1934	6	11	About 50%	69	8

CASE 2.—Aged 27. Married five years and childless; no contraceptives had been used. When aged 24 the patient had suffered from an attack of mumps with right-sided orchitis. There was no history of any venereal disease. Two years previously he had had medical treatment for a suspected duodenal ulcer. His wife had recently been examined by Mr. Cook and considered free from any pelvic visceral disease or abnormality. On examination in March, 1933, the general condition was good and the secondary sex characters well marked. The penis, urethral meatus, and left testis were normal, but the right testis was of small size, though its sensitivity was normal. Both epididymes were apparently empty and almost impalpable; the prostate gland was abnormally small; and both seminal vesicles were only partly distended.

The first specimen of semen examined in May, 1933, was 2 c.cm. in volume, and less than a dozen feebly motile spermatozoa were seen three hours after its production. The spermatozoa count was 7 million per c.cm., and a differential count of stained films showed 17 per cent. of abnormal spermatozoa. Bi-weekly injections equivalent to 100 rat units of antuitrin S were given during June and July, 1933. Sexual rest and an increase in vitamin-rich foods were advised. At the second examination of semen in November, 1933, the volume was 1.5 c.cm. and only six feebly motile spermatozoa were noted three hours after production. The spermatozoa count, however, had risen to 52 million per c.cm., and the proportion

TABLE II.—*Examination of Semen in Case 2*

Date.	Volume (c.cm.).	Hours before exam.	Motile sperm.	Total sperm. (mill. per c.cm.).	Abnormal sperm. (per cent.).
May, 1933	2	3	Less than 12	7	17.2
ANTUITRIN S DURING JUNE AND JULY					
Nov., 1933	1.5	3	6 (feebly)	52	12.5
ANTUITRIN S DURING NOVEMBER AND DECEMBER					
May, 1934	3.5	5	About 10% (highly active)	75.5	10.5

abnormal was reduced to 12.5 per cent. A further series of injections of antuitrin S was given once weekly during November and December, 1933. A third examination of semen followed in May, 1934, when the volume was found to be 3.5 c.cm. There were about 8 per cent. of motile spermatozoa, some highly active, five hours after coitus, and the spermatozoa count was now 75.5 million, with 10.5 per cent. abnormal. In view of the increase in the numbers of spermatozoa no further treatment was given. Pregnancy in the patient's wife was diagnosed in April, 1935, and a healthy child, 10 lb. in weight, was born last November.

Table II. summarises the various counts made.

In both these cases the number of spermatozoa increased and their quality improved after administration of gonadotropic hormones. In both of them, moreover, the treatment was followed by pregnancy of the wife leading to birth of a normal full-term child, although the marriages had previously been sterile for periods of three and five years.

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THREE ARTERIAL EMBOLECTOMIES IN THE SAME PATIENT

INCLUDING ONE IN EACH FEMORAL ARTERY

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ONLY ten cases of successful arterial embolectomy have been recorded in Great Britain. The case here reported is the first, so far as I know, in this country of successful femoral embolectomy, and it is singular in that in this man embolectomy has now been successfully performed upon both his femoral arteries at an interval of a year. He has had altogether three separate emboli removed from three different sites—one in January, 1934, and two others in December, 1935. The patient illustrates the after-history of embolectomies as described in a recent leading article in *THE LANCET*,¹ and shows that the prognosis of successful embolectomy is that of the primary condition, and is not, or should not be, affected by the operation itself.

FIRST ILLNESS

The patient was a man, aged 44, suffering from auricular fibrillation and bedridden on and off for 18 months. He was admitted to hospital Jan. 4th, 1934, with a history that a week previously he had had an attack of agonising colicky pain across the lower part of the abdomen, so severe that in spite of being bedridden, he had to get up and walk about to relieve the pain. His bowels moved, but he passed no blood. At the time, and subsequently until his second operation, I assumed that this pain was due to a small mesenteric embolus. I am now convinced however that this pain was spasm in the large vessels on the posterior abdominal wall, due to the passage of the embolus. At 9.45 p.m. on the day of admission there was a sudden feeling of numbness in the left knee. This was painless at first and gradually spread down his leg to the foot. The limb felt cold and dead and when he touched it with his other foot it felt "as though it belonged to someone else." Within 15 minutes the numbness changed to a tearing, burning pain; the limb felt as if it were bursting, as though the skin was too tight, and the pain began to spread up the thigh. It was, he said, worse than anything he had suffered in his life, and it persisted unchanged until operation. He applied compresses of scalding water to the leg, but these failed to relieve the pain, and it was only slightly alleviated by morphia gr. $\frac{1}{4}$. Dr. L. L. Hurwich saw him and diagnosed the condition immediately as one of embolus of the femoral artery and sent him to hospital, where he was admitted at 12.30 a.m. on Jan. 5th.

Examination.—I saw him at 1.30 a.m.; he was still in a condition of extreme shock, pallid and sweating, with drawn face and suffering intense pain in spite of the morphia. His left lower limb below the middle of the thigh was cold, shrunken, marbled, and felt greasy to the touch. It was anæsthetic and voluntary movements were absent. Pulsation could only be felt in the upper few

¹ *THE LANCET*, Jan. 4th, 1936, p. 33.

inches of the common femoral artery—i.e., in the region where one feels it in the normal thigh—but not in the vessels about the ankle.

The operation was begun at 2.30 A.M., and as the pain had commenced above the knee his popliteal artery was first explored under local anaesthesia, together with morphia, hyoscine, and atropine. The artery was readily exposed and found to be collapsed; it was obvious that the block was higher up. The femoral artery was therefore next explored in Scarpa's triangle, the pulsation being traced down to where it ceased, which was just above the origin of the deep femoral artery. The upper margin of the embolus could be felt as a sharp edge; its lower limit passed imperceptibly into a long clot which extended several inches down the superficial femoral artery. The affected length of the artery was isolated only on its superficial aspect, and fine rubber tubes were passed under the vessel above and below the affected segment; it was occluded by pulling upon the rubber tubing, thus kinking it and complete occlusion was obtained by pressing the two parts of the rubber tubing together close to the artery. The vessel below the clot was gripped between the finger and thumb of the left hand, and a longitudinal incision was made over the embolus. As the artery was opened the embolus, followed by the clot, was milked out in one piece by the finger and thumb from below, passing upwards along the vessel. Extrusion was accompanied by a gush of blood which, from its direction, must have come from the deep femoral artery. The milking process was repeated, and a probe was passed down the vessel; the incision was then sutured. When this was completed pulsation had returned to the exposed length of the superficial femoral artery and the patient declared that his pain had all gone; his general condition also began to improve immediately. By the time the wound was closed capillary reaction had returned to the foot and sensation was also coming back. Pulsation did not return to the posterior tibial artery until that evening.

The wound healed by first intention, and the man was discharged home in about two weeks. In May his doctor informed me that he was in good health and that his leg had remained normal in all respects.

During the operation several interesting facts were noted; that, in the region affected the induction of anaesthesia was unnecessary, as only above the level of the embolus in the artery was sensation present in the artery itself; the tissues in the affected area were bloodless; the superficial tissues appeared to be insensitive to the ordinary operative manoeuvres up to the same level, and this level appeared to coincide in the limb very accurately with the level of the embolus in the artery. It was difficult to secure haemostasis and to appose accurately the edges of the incision at the site of the embolus, although it was easy above that level; haemostasis at the suture line was readily obtained in the uninvolved portion of the artery, but was delayed in the affected part, probably attendant upon the restoration of the circulation in the walls of the artery. After suturing the vessel the upper part of the incision was dry immediately. The lower part required swab pressure for several minutes before it, too, became dry.

SECOND ILLNESS

On Dec. 14th the patient was readmitted to the hospital as an emergency with a history of having had the previous day an attack of abdominal pain, vomiting, and diarrhoea; there was no blood in the motions. The pain commenced to the right of the umbilicus and stayed there for about an hour and then moved down to the right iliac fossa and also to the right loin. Later the pain became worse and also radiated down to the right testis; he vomited every time he drank and he could not sleep because of the pain. He had no increased frequency or haematuria, and he was sent into hospital as a case with possibly renal colic, or, from his history, an embolus of the renal artery.

On admission there were no physical signs obtainable, and it was decided to watch him. His urine was normal

in all respects, and it was thought most probable that he had an embolus. Between Dec. 15th and the morning of the 18th he was quite well without any pain or other symptoms. At 10.20 A.M. on the 18th he suddenly complained that he was getting pain in the middle of the thigh and his right leg was going dead "just as it had done last time." At 10.30 A.M. when I saw him the right leg was exactly as the left had been one year previously, and the diagnosis of an embolus at the origin of the right deep femoral artery was made. While waiting to be taken to the theatre he complained that his left leg was also feeling numb, and that he had colicky pain across the lower half of his abdomen. On re-examination pulsation was still present in the right common femoral, but had disappeared from the left. It was therefore thought that in addition to the embolus in his right femoral artery he had an embolus at the bifurcation of the left common iliac artery.

Operation was begun at 11.30 A.M., by which time both lower limbs were cold, pallid, and anaesthetic. He still had no great degree of pain, his complaint being only of the numbness. Spinal anaesthesia was used, and an oblique incision was made cutting through muscle to expose extraperitoneally the left common and external iliac arteries, the peritoneum being retracted well to the right side. A large embolus was felt in the common iliac artery proximal to its bifurcation. The common iliac, just below its origin, and the external iliac, well below the embolus, were occluded by rubber tubing, and the artery was incised just above the clot. Owing to the depth and the difficulties of exposure, it was impossible to incise the artery, as one wished, completely above the embolus. By incising the artery, however, and by milking up the embolus I succeeded in removing it intact; its exit was accompanied by a spout of blood which appeared to come from the internal iliac. The wall was sutured and with swab pressure for a few moments became quite dry. After waiting a few minutes pulsation could be felt in the external iliac artery, and even before the wound was closed, colour had returned to the foot. The right common femoral was exposed and an embolus was removed in a way similar to that on the left a year previously. Here, however, one was able to incise the vessel completely above the embolus, and haemostasis was immediate and complete on suturing the incision. By the time this incision was sutured, pulsation had returned to both the posterior tibial and dorsalis pedis arteries of the right foot.

Progress.—Healing of the incisions was uneventful, and both legs became normal with the single abnormality, that even after two weeks, when he was sent home, pulsation had not returned to any vessel in the left lower limb, in spite of this the superficial circulation, feeling and movements were quite normal. This is difficult to explain as pulsation was seen and felt to return to the external iliac at the operation. The vessel appeared in a state of spasm when incised; suturing was difficult and possibly the bites taken of the wall were too large. This, in association with the previous embolictomy in the left common femoral, might account for the persistent absence of pulsation.

COMMENT

In all three vessels operated upon there was much spasm in the affected portions, and it appeared to diminish the size of the artery by more than a half. In the first operation an ordinary curved intestinal needle was used to suture the artery; in the second, a very small hare-lip needle, which is much more suitable to use; but the former, in spite of its size, was quite satisfactory. Ordinary fine silk soaked in liquid paraffin for half an hour was used on both occasions.

Recently attention has been drawn to non-operative methods of treating the condition of arterial embolism, but the operation is so simple and easily performed, and can be carried out in the limbs under local, or possibly no other anaesthetic than morphia, &c., that I think no alternative is required. When once it has been seen, one does not readily forget the

dramatic relief which is given to a patient by removing an embolus, and by the immediate improvement in his condition. It seems important to relieve the obstruction at a point where not only the main but the collateral circulation to a part is simultaneously occluded. Even if some clot remains behind, one is sure of freeing at least the collateral circulation, and this, even if it does not prevent gangrene, limits it to the more distal parts of the limb. In this patient, when an embolus was removed from the junction of the superficial and deep femoral arteries, a very strong gush of blood came from the deep femoral, so that we felt sure that even if only the passage between the common and deep femoral were freed, a good circulation would be established.

In all three operations there was no doubt that the embolus, from its size, could not have gone further; there was so much spasm below and, to some extent, above, that the embolus stood out as a definite bulge in the line of the artery. Hence massage in these instances, where it could have been applied, would have been valueless. In the first operation, when about five hours had elapsed between onset and operation, a clot about 3 in. long was present distal to the embolus. In the second and third operations, when only an hour had elapsed, there was no clot present at all. This is why success follows an early operation more often than one long delayed. All three emboli were tough, solid masses.

In the history of this case there were several features which are not typical. The site of maximum pain was well below that of the embolus, and not, as is usually described, directly over the site of impaction, and the onset which was gradual rather than sudden. In his second attack he had no severe pain even after an hour. From the history preceding this attack I feel sure that his abdominal pain on both occasions was due to spasm and to the passage of the embolus along the aorta.

I wish to record my gratitude to Mr. Peter McEwan for his kindness in allowing me to treat this case and to report it to the Bradford Medico-Chirurgical Society in January, 1935, and also for his permission to publish it.

A CASE OF ALCOHOLIC PSEUDO-PARESIS

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THE condition known as alcoholic pseudo-paresis was more familiar to the older psychiatry than it is to that of the present day, and cases are now comparatively rare. Bleuler writes: "Probably because the concept of paresis has become clearer we have not seen for ten years any disease we could designate as alcoholic pseudo-paresis."¹ As there is even a tendency to deny its existence altogether I think it desirable to place on record the present case, which is the first in my experience.

The condition was first described as a clinical entity by Magnus Huss² in 1852, but it was recognised imperfectly before that time. For example Huss quotes Brühl-Cramer's account of "a condition of torpidity of the nervous system associated with the appearances of general muscular weakness and thus a particular sluggishness of all functions voluntary as well as involuntary." Since Huss wrote, there have been many other reports of cases, including a

very interesting one recorded by Régis³ in 1883 where the patient had had no fewer than 16 attacks of the disorder, in some of which it was diagnosed as general paralysis by distinguished psychiatrists and in all of which it cleared up completely. Good descriptions of the disorder are to be found in all text-books of psychiatry and it is unnecessary to go into particulars here. Like the Korsakow syndrome, of which it is a form, it appears to be rather commoner in women. All writers stress the good prognosis if alcohol be withheld.

Mrs. A. B., aged 52, was admitted to the Cassel Hospital on July 26th, 1935. This hospital does not admit organic cases but from the account given by her doctor it seemed that she might benefit from admission.

The family history was essentially negative, but her husband was unable to furnish many details of it or of her early life.

Personal history.—The patient, who had been on the stage, was of Scottish birth and extraction and had evidently been a difficult child. There was a definite history of syphilis, which had been fully treated by a distinguished syphilologist who pronounced her free of the disease before marriage; the blood Wassermann reaction had been negative 15 to 20 years before admission. There was also a history of "a dropsical tendency" about 30 years previously—perhaps a syphilitic nephritis. More recently she had been operated on for arthritis of the knee, but no further details of this were forthcoming.

The patient had had a child before marriage but no other children. She was married in 1908 and her menopause occurred about 1½ to 2 years before admission to hospital in 1935. Her married life had been extremely unhappy, both because of her husband's taste for other women and her own cyclothymic, paranoid personality, quick to see insults and hypersensitive, jealous, and exacting. In addition she was prone to violence, assaulting servants if they displeased her and flying into uncontrollable rages. All this had been observed before she started drinking; for she had become a teetotaler from marriage and there was a history of only a year's indulgence in gin and burgundy up to admission. There was no history of drugs.

Before her menopause there had been no signs of definite mental illness; but about this time she became very depressed and apathetic, although she had hitherto been an active woman with many interests. Finally she made a suicidal attempt which her husband thought was chiefly histrionic but which led to her commitment. After a few weeks in a mental hospital she was discharged recovered and to her husband seemed perfectly normal. Soon afterwards however the old quarrels began anew and life with her at home was impossible. For a year she had been drinking heavily. It is hard to say with precision when the symptoms which she presented on admission began, for her husband was not living with her at the time. That they were of recent origin is almost certain—at least in their grosser form—as her private doctor could scarcely have overlooked them. It is likely that he did not see her immediately before admission. There was no history of any other alcoholic psychosis.

On examination a well-built, rather stout woman of florid complexion. On reaching hospital she was unable to walk and could hardly stand without assistance. Her pupils were equal, circular, and moderately dilated. The right reacted very sluggishly to light (direct) but the consensual response was brisker. The left pupil was also sluggish to light but rather less so. Both reacted quite well on convergence. There seemed a slight paresis of the right face, but this was difficult to establish. The tongue was furred; protruded in the midline; there was a medium tremor. There was also tremor of the lips and considerable slurring of speech as evidenced by the test phrases. This slurring was of the type usually seen in general paralysis. Vision in the left eye seemed a little defective, but owing to the mental state it was impossible to be certain of anything in which much coöperation was required. Both discs were somewhat pale but within physiological limits. The remaining cranial nerves showed nothing abnormal.

There was no evidence of paresis of the limbs and both grips were good and equal. No wasting of muscles. The deep reflexes were equal and active. Superficial reflexes: abdominals were not elicited (abdomen very flabby); both plantars gave a flexor response. There was considerable failure of coördination as evidenced by the finger-nose test, some dysdiadokinesia and, as already stated, inability to maintain an upright posture without assistance. There was a medium tremor of the outstretched fingers. Sensation could not be examined owing to the clouding of consciousness; next day, when she could cooperate better, no disturbance was found.

The pulse-rate was 70 and the radial arteries not thickened. No enlargement of heart, but sounds muffled all areas; no bruits. Blood pressure 156/90. Other systems: nothing abnormal found.

Mental state.—She was dull and lethargic; her face was stupid and heavy looking, and her words came slowly. There was some degree of agnosia. She was two days out in the date and could not furnish the time of day. She answered questions irrelevantly. There was no evidence of delusions or hallucinations. The immediate impression was that of a case of general paralysis or some intoxication.

Progress.—Next day she was slightly clearer and was able to give some account of herself. She said she was depressed and admitted drinking heavily, speaking bitterly of her husband's behaviour. She complained of memory difficulty and said she could not remember next morning what happened the day before. This was objectively demonstrable although it was not as gross as might have been expected. The disorientation in time persisted in the same degree but that for space and identity was intact. She could not reproduce a simple story told to her and missed its point. Her grasp of general information was patchy, though better than might have been expected; but she failed miserably in the simplest calculations and could not repeat even four digits backwards.

Three days after admission her speech was slightly less slurred. There was now no evidence of agnosia in any field nor apraxia; though she still spoke a little irrelevantly she remembered details of her previous conversation with me. Her mood was unstable and she readily broke down into tears, bemoaning her position. Four days after admission the slurring of speech seemed even less manifest but was still present. Both pupils now reacted briskly to light and the tremor of the tongue had diminished. Her mood was rather hostile and she spoke in the dramatically portentous manner of the slightly intoxicated. Next day there was little change, but memory tests revealed a much grosser defect of recent memory than she had previously shown. She was again friendly and cooperative. On August 2nd, 1935, it was possible to satisfy oneself that there was no disturbance of sensation, and the day after this there was a distinct improvement all round. The speech difficulty had disappeared and the tremor of the face also, whilst that of the tongue was much less. She was now correctly orientated but still failed in simple calculations. For the next week she made steady improvement and on August 10th she was correctly orientated, her memory much improved, her mood much more stable. Five days later the only remaining feature was a slight tremor of the lips; she was so much improved that she was able to go up to town and do a round of shopping accompanied by a nurse. By August 29th she made a completely normal impression, but it was found that she was still shaky in signing her name and she could not perform the finer movements such as sewing. She left hospital on Sept. 18th, as she did not wish to stay longer, completely recovered.

Serological findings on admission.—Cerebro-spinal fluid: clear and colourless apart from a few red corpuscles; cells 3 per c.mm.; 580 red cells per c.mm.; protein 0.055 per cent.; globulin, Nonne-Apelt and Pandy reactions negative; Lange's goldsol test, no change in any tube. The Wassermann reaction was negative in blood and cerebro-spinal fluid, and the latter was held to be within normal limits, affording no evidence of neurosyphilis.

The serological findings leave no alternative to the diagnosis of alcoholic pseudo-paresis, the rarity

of which in the last few years must be attributed chiefly to (1) a change in the habits of the people, with consequent reduction of the alcoholic psychoses in general, and (2) an improvement in means of precise differential diagnosis—a factor probably of equal importance. The present case demonstrates the good prognosis of this disorder and the rapid recovery following withdrawal of alcohol. The patient was seen again on Oct. 22nd and except for her worries was perfectly well.

I am indebted to Dr. J. G. Greenfield, of the National Hospital, Queen-square, for kindly carrying out the necessary serological examinations.

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JAUNDICE DUE TO PHENOBARBITAL

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Phenyl-ethyl barbituric acid (now officially called phenobarbital) was first introduced in 1913, and has been used extensively since that time. Huddleston,¹ who reviewed the literature up to 1928, reported toxic effects in 22 out of 1000 patients taking phenobarbital, and it is now generally agreed that evidence of poisoning may be expected in as many as 2 or 3 per cent.

The toxic manifestations are similar to those of barbiturates in general, as described at length by Lundy and Osterberg² and by Gillespie.³ They include morbilliform eruptions, nervous disturbances such as vertigo, ocular disorders and coma, and certain general effects—fever, albuminuria, nausea, and vomiting. Jaundice, however, is almost unknown. Pemberton and Pearson⁴ claimed that their patient showed all the known cutaneous and visceral effects except hæmaturia, and although the liver was enlarged jaundice was absent. Scarlett and Macnab⁵ in a recent survey of phenobarbital fatalities do not mention jaundice. Huddleston¹ described more or less severe and constant epigastric pain, not responding to diet and alkalisation, in 5 per cent. of 1147 cases in which phenobarbital (in an average dose of 3 grains daily) had been given over a period of years; but none of these patients had jaundice.

There is some evidence that barbitone (Veronal or diethyl barbituric acid) can cause liver damage. Gerlach and Bredmose⁶ at the Viborg Mental Hospital confirmed the observation of Ravn⁷ that veronal damaged the liver, and found positive urobilinogen and bile-acid tests when veronal was given continuously and also (less often) when it was administered intermittently. Apparently clinical jaundice did not occur.

In 1925 Parkes Weber⁸ described the case of a choreic girl, aged 13, who developed a morbilliform eruption with jaundice and bile-containing bullæ after taking 0.1 gramme (1½ grains) of Luminal* daily for 14 days.† The stools were pale and the

* A proprietary preparation of phenobarbital.

† The dose was incorrectly given in the original paper but was corrected by Dr. Parkes Weber subsequently (*Brit. Jour. Child. Dis.*, 1927, xxiv., 328).

urine contained bile. The van den Bergh reaction was positive, and the icterus index was 40. The child was not seriously ill and had no pyrexia; the Wassermann reaction was strongly positive. The case I wish to record was as follows:—

A man, aged 50, with well-marked hyperthyroidism was admitted to hospital in order to be prepared for thyroidectomy. He was given 1 grain of phenobarbital every night, beginning on August 15th, 1935, while preliminary investigations of basal metabolism, &c., were being made. On Sept. 2nd a course of liquor iodi aquosus B.P.C. (Lugol's iodine), 5 minims three times a day, was begun. All went well until Sept. 4th when the patient had some conjunctivitis. On the 6th a diffuse macular rash appeared and phenobarbital and iodine were discontinued. He became drowsy and was strange in manner. The macules coalesced and small vesicles and pustules appeared and the mucous membrane of the mouth was affected. Itching was considerable. The temperature was remittent, 102°–104° F., and the patient obviously very ill. On Sept. 10th jaundice appeared and increased until it was very deep. The liver was enlarged about half-way to the umbilicus. The van den Bergh reaction was prompt direct positive (15 units). Bile salts and pigment and albumin were present in the

urine. The stools were pale. The Wassermann reaction was negative. The whole picture slowly subsided and by Sept. 25th his temperature was normal. Very extensive desquamation followed, and he left hospital on Oct. 26th.

Toxic symptoms appeared in this case after 1 grain of phenobarbital had been given daily for 22 days. Subsequent administration of Lugol's iodine caused no ill-effect, and hence the illness cannot be ascribed to iodine. The skin condition was typical of phenobarbital poisoning, and since jaundice occurred concurrently, in the absence of any other cause, my conclusion is that the jaundice was produced by phenobarbital.

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MEDICAL SOCIETIES

TUBERCULOSIS ASSOCIATION

At a meeting of this association held on Feb. 21st the first subject discussed was

Primary Tuberculosis in Children and its Relationship to Meningitis

Dr. H. H. SCOTT said that twenty years ago it was recognised that tuberculous meningitis was usually part of a general tuberculosis, the primary seat being often in the bronchial, cervical, or mesenteric glands, by the infective material passing to the meninges by way of the lymph or blood stream. Had there been much advance since then? How did or could such a tuberculous gland give rise, by way of the lymph stream, to a meningitis? While some of his own cases apparently confirmed the prevailing idea that in blood invasion the brain or meninges was the first to suffer, Dr. Scott believed this idea to be a fallacy, in view of the numerous exceptions—e.g., cases in which the spleen, liver, and kidneys were involved, but the brain and meninges escaped. Even with focal lesions in the lungs, however, it was difficult to explain tuberculosis affecting no other secondary site. He knew of no lymphatic connexion between the lungs and the base of the brain, and one was driven to conclude provisionally, that the infection was conveyed by the blood, although, where there was extensive involvement of the meninges, invasion of other parts might have been expected. It was sometimes impossible to discover any primary focus; this might be so even in the presence of widespread dissemination (the *granulie primitive* of French writers) possibly due to a massive exogenous infection, especially in debilitated subjects—for example, as a sequel to one of the acute exanthemata. Meningeal tuberculosis might occasionally be primary, as in the case of a child four years of age in whom the meningeal tuberculosis was the only discoverable lesion. In his series of 300 autopsies on tuberculous subjects, meningeal infection was found in 41 per cent. of 225 children under ten years of age, and in 49 per cent. of 65 adults over twenty years. The distribution of the milia gave no support to the statement, frequently made, that tubercles may

often be found along the fissures of Sylvius when they are not discoverable elsewhere in the meninges. In only one case in the whole series—in a man 27 years old—a few tubercles were found along the fissures without involvement of any viscus other than lungs and pleura. Tuberculous tumours of the brain, tuberculomata, or conglomerate tubercle might or might not be associated with meningitis. They were often multiple and had a special predilection for the cerebellum, the base of the brain, and the basal ganglia. Judging from his own cases (9 in the whole series), the association of conglomerate tubercle with meningitis was largely fortuitous, and one might exist without the other until the tumour reached the surface and so came to affect the covering membrane.

Dr. C. H. C. TOUSSAINT said that tuberculous meningitis and miliary tuberculosis were metastatic manifestations of tuberculous disease and not primary forms. Usually it was possible to find at autopsy the primary site of infection. The two main sources of infection were bovine and human tubercle bacilli with their carriers. Summarising the investigations of a large number of workers in this country and elsewhere into the occurrence of bovine infection in tuberculous meningitis, the speaker said 25 per cent. had been shown to be due to bovine bacilli and 75 per cent. to the human type. The fact had thus been amply confirmed that in the primary tuberculosis of childhood human infection was of far greater importance than infection with the bovine type of bacillus. In the Lancashire investigation of deaths from non-pulmonary tuberculosis in children of 0–5 years, tuberculous meningitis accounted for two-thirds of the deaths. Dr. Toussaint showed slides giving particulars of the human contacts of 80 children aged 0–10 who died from tuberculosis in Bermondsey during the years 1928–35. The probable human source of infection was found in 46 out of 54 cases in which complete investigation was possible. Early notification was of vital importance to enable the tuberculosis officer to investigate the source of infection, but it should not be forgotten that notification should be made only on definite evidence of tuberculous disease. In cases of tuberculous meningitis or miliary disease, it was often difficult to establish a true diagnosis, but

increased use of chest radiology in such children should be of considerable assistance. In prevention, bearing in mind that the major problem was the danger of human infection, there were three main lines of procedure: immunisation of children exposed to risk; boarding-out of contacts; and—perhaps most important of all—the segregation in institutions, if possible, of patients with tubercle bacilli in the sputum. These must be found at as early a stage as possible and maintained in hospitals or sanatoria for as long as possible. Too often they saw a chronic sputum-positive case returned home for no other reason than that there was “no further advantage in retention.” The use of the local municipal hospital for the care of advanced cases was of great service in this respect.

Tuberculosis of Bones and Joints

At the second session the subject for discussion was the Treatment of Tuberculous Lesions of Bones and Joints.

Sir HENRY GAUVAIN said that there was one point of fundamental importance to be remembered—that a tuberculous bone or joint lesion was an osteitis or arthritis occurring in a tuberculous patient, or in other words, that it was secondary to a primary focus occurring elsewhere which might or (more usually) might not be discovered. If this was admitted, treatment logically followed on two lines, local and general. Radical treatment of the local lesion, by which he meant extirpation of the lesion, became less often indicated, although it was still of value in certain circumstances such as tuberculous disease of the knee-joint in an adult. As a rule conservative treatment was called for, and this, in the case of tuberculous disease of bones and joints, might be defined as the adoption of all measures which tended to improve the patient's health, to increase his powers of resistance to tuberculous disease, and to preserve or restore the part attacked; while sometimes it might be wise also so to fix the lesion by operative treatment that the affected part was immobilised and later risk of deformity or disability minimised—the treatment still, however, being strictly conservative. In children suffering from advancing and progressive spinal caries he would unhesitatingly avoid bone-grafting or fusing, since mechanical immobilisation alone would almost always result in cure. Later on, after successful treatment, if the patient had poor dorsal musculature and could not have satisfactory after-care supervision, a bone-graft was definitely indicated. Even in adults, osteosynthesis should only be performed when the disease was becoming quiescent. In tuberculous disease of the hip, where adequate conservative treatment was undertaken and efficient after-care given, operation was not as a rule called for. In any case he did not favour operative treatment in the acute stages of hip disease, nor in any case of tuberculous disease of the knee-joint in children. In adults with tuberculous knee-joints he usually favoured excision. Turning to general and adjuvant treatment, Sir Henry said that climatic and seasonal changes were of value to the patient, producing varying stimuli which were of great assistance. Sun-bathing, light treatment, and sea-bathing were also helpful in suitable cases and in suitable dosage. But though open-air treatment was now advised by general consent, many wards designed for the purpose were miserable and cheerless structures. To make such wards completely open on one side was not only unnecessary, but sometimes even cruel.

A folding wall on the south side which could be instantly opened or closed was preferable.

Mr. G. R. GIRDLESTONE said he fully appreciated the fundamental consideration underlying the conservative treatment of tuberculous disease of bones and joints, in that it was a local manifestation of a general disease; and he entirely agreed that a long period in hospital such as was rendered necessary by the conservative treatment was of immense advantage in countering the general disease and ought not to be cut short by operative measures which led to either the excision of the diseased focus or the arrest of the diseased focus by some form of fusion operation. This long period in hospital, whether or not the treatment was purely conservative, was especially advantageous to children, both because in childhood lymphatic tuberculosis was far more likely to be still active and even widespread, and also because they thrive under prolonged rest, in a well-run open-air hospital. For patients above the age of twenty these special considerations no longer applied, and the economic factor had also to be reckoned with. Those who favoured purely conservative treatment had, he thought, been biased by statistics based on cases many of which were probably not tuberculous at all; or on cases which for reasons of distance or age never returned to the hospital and were set down on the records as cured. The reasons for deciding on an operation were: the preservation of life (e.g., amputation in middle life for proved and active tuberculosis of hip or knee, or wide excision in the presence of persistent sepsis added to tuberculosis); the elimination of persistent disease (e.g., in proved active tuberculosis of elbow or shoulder in or after middle life); and the aim of “a permanently safe and useful limb” (Lovett), including the spine. The decision here depended largely on the extent of destruction and the mechanics of the limb or body in relation to the site of disease. A further object of operation was to save time in bed (e.g., in adults in whom the joint focus had outlasted all signs of lymphatic tuberculosis due to mechanical strain). But where the joint disease was of comparatively recent origin, indicating therefore active lymphatic tuberculosis, there could be no cutting short of general treatment. This reason, therefore, could only apply in a strictly limited field.

SOCIETY OF RADIOTHERAPISTS

At the first scientific meeting of this new society, held on Feb. 21st, the chair was taken by Dr. G. B. STEBBING, the president, and Mr. GEOFFREY KEYNES opened a discussion on the technique of

Radiotherapy in Carcinoma of the Breast

which has not been previously treated. He found it difficult, he said, to adhere strictly to the title, for he regarded radiotherapy as a method to be used in conjunction with other methods; sometimes surgery was the right treatment, sometimes surgery and radium, sometimes X rays, and sometimes radium alone. Radiotherapeutic technique had been retarded by the custom of confining it to late and advanced cases, because the patients died from metastases before the local effects could be assessed. He recognised more and more the limitations of radium, which would not give greatly better results than good surgery. He therefore used surgery before radium more often than in the past. It was important to recognise that radium was a strictly local method

and many patients did better if it were only used to clear up after surgery. Patients with supraclavicular extensions were unsuitable for radium and did better under a full course of X rays. The limitations of radium were difficult to define; it had not great penetrating power and its effect could be to some extent gauged by the size of the tumour. The palpable part, however, was by no means the whole, and the entire gland must be treated. Mr. Keynes preferred interstitial application because of the inevitable damage to superficial tissues caused by external radium. The radium must never be distributed in cartwheel fashion round the growth but in parallel lines right through the mamma, in order to produce a perfectly uniform field of radiation. If the needles were placed in a grid on a rigid framework, an almost mathematically uniform field could be obtained, but natural contours and variations in thickness interfered with such rigidity; the breast was not a pancake and greater penetrating power was needed in the centre. A more difficult problem was the treatment of the axilla; results had, however, shown that satisfactory irradiation was possible. A needle was introduced along each wall—at least four needles—and often one or two more, converging to form a cone of needles enclosing the axilla. A few long needles might be put down through the pectoral muscle from above, overlapping the others and increasing the intensity in the apex. At least 6 mg. was placed above the clavicle for prophylactic reasons, in the absence of gross manifestations of cancer there. Results had shown, in 148 patients, five-year results closely corresponding with those of surgery. No attempt had been made in this series to dissect the axilla—which often failed, and did more harm than good.

Dr. W. M. LEVITT dealt with X ray treatment as carried out at St. Bartholomew's Hospital—a modification of the glancing or skimming method introduced independently by Finzi and Holfelder. They had two plants; in one they used 200 kv. at 8 ma. at 40 cm. f.s.d., the output being 25 r. a minute. Applicator openings measured 27×18 cm. In the other plant they used 320 kv. at 50 cm., producing 15 r. per minute. Powder had been found better than wax for secondary radiating purposes; it must have a specific gravity of 1 and must have such coherence as to be mouldable. A mixture of sodium bicarbonate, two parts, to one part of Fuller's earth was used, sewn into mackintosh bags. For the anterior field one edge of the applicator rested on the midline of the chest and protective rubber was laid over the chest, humerus, and applicator mouth to limit the field. The posterior field was difficult and important. The applicator entered from behind the axilla, so as to irradiate the axillary contents. The ray must be pointed slightly upwards. There was deficient irradiation below and above the clavicle from these two fields, and this was compensated for by a third field from above the shoulder. The applicator for this field was 5 cm. shorter than the required focal skin distance. The dosage was so arranged as to make the irradiation of the whole area uniform.

The treatment took just under three weeks, one field only being treated on any one day and treatment given daily. The total dosage to the anterior and posterior fields was 1800 r. each and 1600 r. to the supraclavicular field. On the other plant the dosages were 2100 r., 2100 r., and 2000 r. over a period just under a month. In the delto-pectoral region there might be a deficiency if the arm was very mobile, but otherwise irradiation was uniform. The tissue dosage was about 2500 r. or 2900 r. everywhere.

Dr. RALSTON PATERSON described the three main techniques in use in Manchester: amputation plus radium implantation, radium treatment only, and X ray treatment alone. In so far as the radium implant was combined with a radical amputation at the time of operation, the first of these techniques legitimately came within the scope of the discussion. The general idea underlying this method was to irradiate all the gland-bearing areas just beyond the actual wound zone, but to avoid any implantation into the wound itself. Such gland areas included the apex of the axilla, the supraclavicular region, the intercostal spaces, and an implant extending down the rectus sheath from the wound. Although theoretically sound, he was doubtful whether the method actually improved the results of surgery to any greater extent than could be achieved by a radium implantation alone. The second method in use was called a Keynes's implant, and followed, with certain modifications, the original technique published by Mr. Keynes, a technique which the speaker considered a definite contribution to radiotherapy. The modifications had been introduced in order to achieve a complete implantation of the whole mammary gland, to amplify implantation of the apex of the axilla, and to extend the scope of the intercostal implant. In Manchester they had not met with any misadventures as a result of the retro-clavicular implant used to reach the upper part of the apex of the axilla.

Dr. Paterson then presented an analysis of all published figures showing the various results of surgery, radium, and X rays in treatment of breast carcinoma, the striking point of the analysis being the unusually good results which appeared to be obtained in a considerable number of foreign clinics by means of X rays alone. As a result, in Manchester they had been developing an X ray technique *pari passu* with the radium technique. Several different field arrangements were used, all of them based on the fundamental tangent principles, the dose given amounting to some 4000 to 4500 r. throughout the whole breast, and the reaction being carried to the stage of a vigorous moist desquamation. A slide was shown illustrating the very definite white blood count drop occurring as a result of intensive radiation therapy. The drop was most marked in the lymphocyte count.

Dr. FRANK ELLIS said that in Sheffield Mr. Keynes's technique was followed, except that the axillary dose had been found too large, leading to skin atrophy and late reactions. He had therefore started irradiating this area with needles in two planes, one in front and the other behind, 600 r. being given to each field when the patient was subsequently to undergo operation.

Dr. DOUGLAS WEBSTER said he had dealt with 350 primary cases and some patients remained perfectly well after ten years although their dose of radiation would now be considered quite insufficient. No doubt sensitivity varied in different individuals. He considered that the Finzi technique did not bring in the axilla satisfactorily and he supplemented it by an American method, using three or four fields converging on the breast. It was important to avoid damage to the heart when treating cancer on the left side.

Dr. N. S. FINZI said that the maximum dose with the three-field method was delivered where it was most needed: in the apex of the axilla and just above the clavicle. He sometimes rotated the centre axis during the course of treatment so as to get even

irradiation. He thought that radium had a more marked effect on a growth than X rays, especially if it were a resistant growth. One case had recurred after 200 kv. irradiation and had cleared up again, at any rate temporarily, with 300 kv. That was why he was trying to push the voltage still further.

Dr. J. S. FULTON thought that the problem of irradiation of intercostal spaces was best met by using a field 15×7 cm. which would embrace the intercostal region on both sides.

The PRESIDENT pointed out the importance of using any method, even splinting, to keep the patient still while treatment was going on, and said that his aim was to deliver 3000 r. in ten days and 4500 r. in three weeks according to size. He usually employed only two fields, but sometimes four converging on a large breast and five in the axilla. If any appreciable growth was left after treatment of this kind he treated it by interstitial radium.

ROYAL SOCIETY OF MEDICINE

SECTION OF RADIOLOGY

At a meeting of this section held on Feb. 21st the chair was taken by Dr. C. G. TEALL, the president, and Prof. H. CHAUL (Berlin) read a paper on some

Recent Developments in X Ray Therapy

He discussed short-distance low voltage high dosage therapy, designed to replace radium. Its superiority was due to the physical properties rather than to the quality of the rays. A voltage of 60,000 volts with a two-inch focal skin distance was employed. The small focal distance was obtained, he said, by using a monopolar X ray tube of unusual design. At 3 cm. depth the intensity was still about three-quarters that at the surface. The aim was to give a high dose to the disease centre while sparing the surrounding and underlying healthy tissue to assist in the cure. Ulcerated and infiltrated and deep-seated tumours, not amenable to other treatments, could be treated. For cancer of the rectum, the lower part of the sacrum must be removed and the rectum opened up. Four cases had been so treated and all remained free of primary symptoms. Prof. Chaoul showed statistics of cancer of the lip, skin, and mouth treated by his method. Of 109 cases in the skin, 93.5 per cent. had given success; for cancer of the lip the figure was 88.5 per cent. of 26 cases; for the oral cavity (28 cases), 53.6 per cent.; and of 12 melanoblastomata, 83 per cent. had recovered. Sixty-three per cent. of sarcomata also had been successfully treated. The method was contra-indicated in tumours of large size or with many metastases, or after intensive X ray or radium treatment by other techniques.

Prof. Chaoul illustrated his technique by a cinematograph film. This emphasised the sharp energy gradient, the area of irradiation limited to 9–25 sq. cm., the daily fractionated dose of 350–500 r., each application lasting only two to four minutes; and the total dosage of 7000–8000 r. spread over two or three weeks. It also showed the applicators and the results of treatment in a number of cases. In conclusion, he pointed out that there was not enough radium to treat all the patients for whom it was indicated, but this method was available to all countries, even the poorest.

Dr. J. F. BROMLEY sketched the history of short-wave therapy and considered the pathological aspect of the problem. There was no difference between

the effects of varying wave-lengths; the important factor was the energy absorbed per c.cm. and the time spacing. The claims made by the supporters of this technique were: (1) The distribution of radiation was similar to that from surface applicators, and many patients could be treated in a short time with less cost than by radium. (2) The healthy tissues were spared, and the total dosage was of little importance provided the fractioning was kept up properly. Coöperation between radiologist, pathologist, and physician was essential. The limit of the practical depth dose was $1\frac{1}{2}$ –2 cm. At first sight the preservation of healthy tissue seemed very attractive. Much work had been done on the effect of radiations on cancer cells, but less on the normal cell. Satisfactory healing depended on radio-sensitivity, good blood-supply, and healthy surrounding tissue. If, however, Sampson Handley's theory were true, it would be desirable to irradiate surrounding tissues as widely as possible. The giant cells which appeared around tumours attacked cancer cells on one side and were attacked by reticulo-endothelial cells on the other side. The effect of radiation on them was not fully understood; they seemed to show no reaction. It seemed therefore that the natural defence against cancer depended on several factors and that the effects even of heavy radiation resembled closely those of the body's own defence mechanism, and were not so damaging as might be imagined.

Another argument in favour of the Chaoul tube, however, and one insufficiently stressed, was its great convenience. Of 70 cases treated in Dr. Bromley's department at the General Hospital, Birmingham, 22 had recovered and 37 improved—results so good that the method was now a routine for rodent ulcer, only one sufferer from which had become worse. The method was also satisfactory for carcinoma of the vulva. Skin recurrences after cancer of the breast were being treated, with gratifying results. Doses comparable with those of radium therapy were well tolerated. The method filled a very definite and useful place in radiotherapy and offered a valuable sphere of research. It hardly replaced high voltage radiation, and did not absolve the radiologist from giving the usual care to glandular and other areas.

Prof. J. WOODBURN MORISON said that the apparatus he used was simple and easy to handle and gave no trouble, whereas high voltage tubes gave a great deal of anxiety and trouble and were not really practicable for routine work in a hospital. The million-volt plant seemed to work better than the 400-volt. Clinical results from low voltage therapy could undoubtedly be obtained. It was interesting to find the absorption so comparable with that from a radium applicator and even somewhat comparable with the one-gramme bomb. Work at the Cancer Hospital confirmed Prof. Chaoul's results, but the problem of metastasis remained. Where there were metastases there was eventual failure of any method. The problem of cancer therapy was the problem of accessibility. Some observers thought the stomach and cæcum could be exposed, without danger, long enough for the necessary irradiation. One day perhaps the oesophagus would also be exposed. The real justification of radium bombs would only be established when they could treat cases at depth—through the abdominal wall, for instance. Education of the public was still necessary in order that cases might be treated earlier. A great deal of research was also needed. The low

voltage apparatus would be especially suitable for tropical regions, where a great deal of skin cancer was encountered. Prof. Morison concluded with a review of a number of successfully treated cases.

Dr. DOUGLAS WEBSTER expressed his interest in the method, and asked Prof. Chaoul if it had been used in benign conditions, for example, the treatment of tonsils.

Prof. CHAUL, replying through Dr. E. W. Twining, said he had used the method for tonsils, a two-minute exposure every day for four days under local anaesthesia yielding excellent results.

MEDICAL SOCIETY OF LONDON

At a meeting of this society on Feb. 24th Prof. G. E. GASK, the president, took the chair, and a discussion on

B. coli Infections of the Urinary Tract

was opened by Lord HORDER. Additional knowledge, he said, justified another discussion on this condition, which was common and intractable. The discussion would be limited to aetiology and treatment, which went hand in hand. Lesions of the urinary tract fell roughly into two main categories: foci of sepsis and obstructive anatomical defects. It was vitally important to realise that in both categories the lesion might be small and easily overlooked or thought too trivial for treatment, but in this domain nothing must be regarded as trivial. It was not likely that the last word had been heard either of the incidence or of the variety of these lesions. The urgent thing was to recognise them and to hope that more and more of them would be remediable. It might be that by reducing the load of possible infection it would prove possible to cut in between the point of non-infection and of infection. There might be a sort of threshold of infection determined by congenital defects and by residual acquired pathological defects. Congenital defects might be absolute or relative. The discovery of certain congenital abnormalities which predisposed to infection was disturbing, as was also the realisation that the renal calyces had sphincters and that there was a peristalsis and a potential antiperistalsis in the ureters. In fact it was disconcerting as well as disturbing, for here were the materials for functional departures from normal. A prolonged spasm of one of the sphincters, or persistent antiperistalsis, might cause retention, which in its turn might prove an important factor in inducing infection by coliform organisms. There was general agreement that thorough drainage must be established if the urinary tract was to be guarded against infection from foci such as the appendix, gall-bladder, and diverticulitis. The tendency to infection from general gastro-intestinal defects, such as enteroptosis, undoubtedly existed but the mechanism was less certain. Agreement ceased even on the premiss that a causative relation existed between urinary infections and colon stasis and constipation. Efforts to act rationally in assessing values for the relationship between intestinal stasis and other diseases had been hopelessly countered during the past 20 years by that wave of pseudo-scientific opinion which linked the hygienic salvation of the race irrevocably with an artificial and forced evacuation of the bowels several times a day. There had been recently some refreshing and constructive

criticisms of this attitude. Dr. Geoffrey Evans had observed that diarrhoea was much more often complicated by pyelitis than was constipation.

There was general agreement on most points of the treatment, but the majority of writers said that fluids must be pushed from the first, and the speaker regarded a distended and splashing stomach as a quite unnecessary addition to a very uncomfortable inflammation. It was no use attempting to flush the apparatus until the renal tissue was ready and willing to be so treated. The generally accepted indications for a thorough investigation of the urinary tract were: (1) the general survey suggests that a lesion is present; (2) an acute infection threatens to become chronic despite thorough medical treatment; (3) there are intermittent symptoms despite a medical routine calculated to keep the general health sound and the bowel function at its best; (4) medical treatment fails and the condition becomes chronic. In the chronic case the aim must be the production of a soft, formed stool of reasonable bulk. Milk was to be avoided even in acute cases, but apparently it was the casein residue which did the harm, since junket and cream did not have the same baleful effect. Game, rechauffé dishes, and salted meats and fish were to be avoided, and eggs and butcher's meat excluded for a time. An increasing bulk of soft celluloses (sieved root vegetables and dried fruits) was added. If laxatives were needed agar-agar or paraffin was suitable. Lord Horder had not seen any lasting good results from colon irrigation, and his experience of sour milk and *Bacillus acidophilus* had been disappointing. He still advocated antigen therapy in certain chronic and intermitting cases.

DISCUSSION

Dr. S. A. MILLEN uttered a plea against the hazardous use of acidification therapy. It was, he said, practically important to ascertain in each case whether the infection was ascending or blood-borne. The normal tract would drive out organisms by flushing; acidification would help even the abnormal tract to free itself of infection. The difficult task was, however, to prevent reinfection. In rather more than 50 per cent. of children and 40 per cent. of adults urinary obstruction, with consequent stasis, was associated with infection. Inflammatory foci were either intrinsic—e.g., tuberculosis and neoplasm—or extrinsic, including such causes as an infected cervix. This predisposed to urinary tract infection for two reasons: the female external meatus was constantly bathed in bacterial secretions, and, secondly, the urethra and bladder base were in a state capable of providing a suitable nidus for infection. The analogue in the male was the infected prostate. Instrumentation, whether by the urethra or the ureter, was always unpleasant and dangerous, and should only be used if a case had lost ground under adequate medical therapy; ureteric stasis was one indication, and another was an infective process due to incomplete emptying of the bladder behind a large prostate or incomplete emptying of a renal pelvis, when drainage was urgently called for.

Dr. CUTHBERT DUKES remarked that if *B. coli* was introduced deliberately into the bladder of 100 healthy people only a small proportion would develop the infection. It would be interesting and instructive to discover why some persons became infected and others not. Such an experiment was provided daily by patients suffering from post-

operative retention of urine lasting for three or four days. Bacteria were almost always present in the stagnant urine. It did not matter whether they were introduced by the catheter or by the kidney or lymphatic channels. Observations on 214 such cases showed that infection was accompanied by a sudden rise of temperature about the fourth day. About 46 per cent. developed *B. coli* infections: 59 per cent. of the women and 36 per cent. of the men. Urinary infections depended on defective function of the urinary organs, and any factor which disturbed the normal mechanism of urination would increase the likelihood of the infection.

Mr. H. P. WINSBURY-WHITE stated that all chronic cases of urinary tract disease tended to become complicated by *B. coli* infection but a large group remained which did not fit into this category. In the former group a mixed infection often preceded the coliform infection—i.e., by staphylococci, streptococci, and diphtheroid bacilli. This prepared the ground for the implantation of the coliform growth. Chronic frequency in women sometimes developed into acute pyelonephritis and sometimes settled down into a chronic *B. coli* infection. A single examination often revealed a sterile urine but a second test might well show a mild infection. In many cases of staphylococcal abscess of the kidney the urine was sterile or contained only *B. coli*. Caution was therefore necessary in interpreting a sterile urine. Cystoscopy and urethroscopy frequently gave the lie to the negative urine test. Several groups were recognisable among children—e.g., the *B. coli* infection of the urinary tract which supervened upon a respiratory tract infection by cocci. Gastro-intestinal disease, impetigo, and other chronic skin lesions often set up a chronic infection, and persistence of infection in these cases called for investigation of the urinary tract for abnormality. The commonest finding was dilatation of some part of the tract. Phimosis, balanitis, and other local conditions of the tract in children might be responsible.

Dr. O. E. J. MCOUSTRA confessed to bewilderment. He had considered, he said, that the origin of the *B. coli* infection must lie in the alimentary rather than the urinary tract, but the results of a series of test-meals in cases of *B. coli* infection had been completely negative and no common factor had been discernible. One remarkable case in a man of 35 with chronic nasal and pharyngeal catarrh who had an acute attack of *B. coli* infection had been completely and finally cured with potassium citrate.

Mr. E. M. RICHES maintained that the first essential of successful treatment was accurate diagnosis. Acidifying remedies, particularly mandelic acid, gave excellent results in some acute and serious cases, the patient showing an immediate response provided that there was no anatomical abnormality of the urinary tract.

Dr. P. H. MANSON-BAHR said that *B. coli* pyelitis often accompanied malaria and was a consequence of it. More frequently it was a sequel of bacillary dysentery. An investigation he had performed during the war showed that some 80 per cent. of chronic cases of bacillary dysentery also had *B. coli* infection, and he had traced the course of the infection from the bowel wall through the glomeruli of the kidneys—a proof that the disease was blood-borne. He had also isolated the organisms from urine or blood cultures—the true *B. coli* of Escherich and its variations. He had cured with mandelic acid what he considered a unique case of severe anaemia due

to *B. coli* infection in a man who had lived in the tropics. Abnormality in the tract must, of course, be eliminated. It was not necessary to produce acetone and oxybutyric acid in order to succeed. Albumin and hyaline casts were not necessarily an indication for stopping or modifying the treatment. There was no foundation for the belief that mandelic acid therapy, even if prolonged for two or three weeks, led to anything like chronic nephritis.

Dr. JOUKES maintained that, whatever the difficulties might be in manufacturing a bacteriophage effective against streptococcal strains, it was fairly easy to produce one that would combat the coliform group. It was necessary to find a specific phage; the stock commercial virus phage usually gave no result at all against *B. coli*. The phage was now generally instilled into the bladder and left as long as the patient could retain it.

Sir RUSSELL WILKINSON described the case of a married woman with chronic pyelitis who had been unsuccessfully treated with alternate alkali and hexamine mixtures and had aborted a recent pregnancy. She was now in the nineteenth week of treatment by mandelic acid. He had hoped to be able to report that she had been successfully delivered of a normal baby, but her labour was in fact due that evening. Whenever the acid was withheld the urine had become offensive. No renal elements had been found throughout the course.

LIVERPOOL MEDICAL INSTITUTION

At a meeting of this institution on Feb. 6th, with Mr. G. C. E. SIMPSON, the president, in the chair, a paper entitled

Kidney Pain and its Treatment by Renal Denervation

was read by Mr. J. B. OLDHAM. Section of the renal nerves, he said, resulted in increased flow of the blood to the kidney, secretion of a larger quantity of urine of low specific gravity (comparable to that of ordinary diuresis), relaxation of the sphincteric muscles surrounding the papillæ and calices and uretero-pelvic junction, and anaesthesia of the kidney. Animal experiments and operations on the human kidney had proved that denervation has no untoward effects, and the operation had been suggested for the treatment of nephralgia, essential hæmaturia, non-mechanical hydronephrosis, reflex anuria and oliguria, certain forms of nephritis, arterial hypertension, and early renal tuberculosis, and also as a substitute for nephropexy and to prevent the re-formation of calculi after nephrolithotomy. The results of Mr. Oldham's own operations and those of Papin, Harris, Hess, and others showed that, whatever the cause of renal pain, removal of the nerve-supply of the kidney made relief entirely probable. Non-mechanical hydronephrosis, he suggested, was due to overaction of the sphincters of the renal calices and pelvis, and he showed radiograms demonstrating cases in which as the result of denervation pain had disappeared, renal function had improved, and the normal shape of the pelvis and calices had been regained. He agreed with Muschat that essential hæmaturia was often due to congestion of the renal papillæ by overaction of the sphincteric muscles surrounding their bases, and described two such cases in which pain and bleeding had been cured by denervation. Mr. Oldham held that the

usual operations for nephroptosis, in which the kidney was anchored to the last ribs, were unphysiological; for normally the kidney, unlike the ribs, moved downwards on inspiration. The results were not infrequently good, but the benefit was due to the surgeon having unintentionally denervated the kidney when he was fixing it. He himself operated only when there was evidence of pelvic stasis and after a prolonged trial of conservative measures, and he would not consider operation where there was general visceroptosis or marked neurasthenia. But in suitably selected cases denervation seemed to offer a certain cure. He had performed denervation seven times when removing calculi from the kidney in the hope that the consequent diuresis might lessen the chance of recurrence. The nerves could be sectioned most certainly, simply, and safely where they surrounded the outer third of the renal artery; none ran in front of the renal vein and it was unnecessary to strip this aspect of the vein.

Mr. Oldham always operated under spinal anaesthesia, for no other form of anaesthesia gave the same access to the renal pedicle. He insisted on the importance of stripping the pedicle towards the kidney and suggested that the vein should be separated from the rest of the pedicle and retracted to one side. The nerves should be excised over a distance of about one inch, and he thought no attempt should be made to strip either the branches of the artery or the pelvis up to the hilum of the kidney since this was unnecessary and liable to cause troublesome bleeding. If aberrant renal vessels were present they too would be accompanied by nerves, which must accordingly be excised, but it should be remembered that the renal arteries were end-arteries, so that ligation of an aberrant artery inevitably led to partial necrosis of the kidney. After the vessels of the pedicle had been stripped as clean as possible they were painted with 10 per cent. carbolic, which not only destroyed the finer nerve-fibres but whitened any large fibres which had not already been divided and so allowed the surgeon to pick them up and divide them. After operation there was severe pain for two to three days and for the same time the amount of urine was diminished. After a few days the urine increased and examination showed that the denervated kidney was secreting more than the normal one. The excretion of indigo-carmin—usually delayed before operation—was also improved. These urinary changes gradually lessened and after 3-6 months the secretion of the two kidneys was usually equal. In every case before operation retrograde pyelography reproduced the pain of which the patient complained, even on the injection of small quantities of opaque medium. In every case after operation the kidney was quite insensitive to overdistension and 30-40 c.cm. could be injected without the patient being conscious of it. Within 6-12 months, however, there was a slight recovery of pelvic sensation; it was still impossible to produce typical renal colic with nausea, but the injection of large quantities into the renal pelvis caused an ache in the loin. No patient had had any recurrence of symptoms.

In all Mr. Oldham had performed renal denervation 40 times, but cases treated during the last year and patients on whom other operations had been performed on the kidney at the same time as the denervation were omitted from the discussion of the results. On the basis of the results obtained in 28 remaining cases, he contended that if cases were properly selected and an adequate denervation was performed, relief of the patient's symptoms was certain.

Mr. C. A. WELLS agreed whole-heartedly with what Mr. Oldham had said. He had himself performed the operation of sympathectomy on the kidney some 30 times, and had on the whole been delighted with the results. There could be little doubt that it offered hope of relief to many sufferers for whom otherwise little or nothing could be done. Careful selection of cases, however, was very necessary, and it was essential to exclude, by every possible means of investigation, other causes of renal pain. Like Mr. Oldham, he had relied mainly upon the reproduction of pain by means of retrograde pyelography; patients were usually able to express a definite opinion upon the resemblance or otherwise of this pain to that of which previously they had complained. Having established the diagnosis it was his custom to discharge his patients for 3-6 months' observation and treatment, after which, if their history remained consistent, the investigation was repeated and the operation performed if the indications seemed sound. In cases of hydronephrosis with gross dilatation he had employed a modification of Thomson-Walker's plastic operation in conjunction with sympathectomy.

Misleading Cases

Dr. S. BARTON HALL read a paper entitled *Misleading Cases or Psychological Investigation as a Diagnostic Measure*. He had arrived, he said, at two general conclusions: first, that clinical examination at the hands of the patient's own doctor was often difficult to make effective in the nervous patient, owing to a mistaken and misleading modesty, if not actual though unintentional concealment, on the patient's part; secondly, that the time had passed when the physician relying upon clinical acumen alone could feel, with any degree of assurance, that as a result of thorough examination of the patient he had excluded organic factors. Three postulates must be satisfied before a diagnosis of functional disease could be made: (1) the case must prove negative to all laboratory and clinical investigation; (2) a positive psychogenic basis must be found; (3) the psychogenic factor must bear direct relation to the patient's symptoms. Even were all these conditions fulfilled, such a diagnosis could not be made with certainty. The speaker thought that psychological investigation might assist in diagnosis from two aspects—notably from the knowledge gained with regard to types of individual and from the result of detailed investigation of the particular case. He pleaded for the subjective method in investigation since it might provide evidence of organic disorder at a much earlier stage of the disease. Dr. Barton Hall gave the results of psychological investigation of a series of 1000 cases referred in the routine manner—500 from hospital and 500 from private practice. In all, 67 (15 per cent.) of these ultimately proved to be organic in nature, the number of hospital cases (44) being approximately double the number of private cases (23).

ONE HOSPITAL SERVICE FOR MANCHESTER.—The scheme of co-operation between the voluntary and municipal hospitals of Manchester, prepared by the Joint Hospital Advisory Board, was outlined by Mr. Walter Cobbett at the annual meeting of the trustees of the Royal Infirmary. The municipal hospitals are to be divided into medical and surgical units and are to have access to the honorary physicians and surgeons at the voluntary hospitals. This idea of a common staff should, he said, lead to a better distribution of patients and to the reduction and perhaps the abolition of waiting-lists.

REVIEWS AND NOTICES OF BOOKS

Post-graduate Surgery

Vol. I. Edited by RODNEY MAINGOT, F.R.C.S. Eng., Senior Surgeon to the Royal Waterloo Hospital. London: Medical Publications Ltd. 1936. Pp. 1742. 70s. (£9 9s. per set of three volumes).

THOUGH the undergraduate student has admirable text-books to choose from, the graduate who seeks more detailed information about the management of surgical cases must consult modern epitomes or search through monographs and periodical literature for the solution of his specific problems. The aim of this work is the collection of such material in a readily accessible form wherein senior resident officers, candidates for the F.R.C.S., medical officers in the fighting services, and others who desire to keep abreast of the modern developments in surgery may find the guidance which they need in the practice of their craft. As Lord Moynihan points out in a graceful introduction, there is a real call for such a book, and the editor is to be congratulated upon the choice of distinguished collaborators whose combined experience covers the whole range of surgery, including the care of the patient before and after operation.

The first of the three volumes to reach us is devoted almost entirely to abdominal surgery, but it also contains a valuable section on anaesthesia by C. Langton Hewer whose comments on the choice of anaesthetic for operations in special regions are most helpful; also chapters on X ray diagnosis in alimentary and urinary tracts by H. Cecil Bull, and on radiotherapy by Stanford Cade and Malcolm Donaldson. It is noteworthy that Dr. Bull has confined his attention entirely to the interpretation of radiograms without supplying any details, even when cholecystography and pyelography are under discussion, about the technique of administering the appropriate opaque substances. It is doubtless assumed that the graduate will be familiar with such matters; but he would probably be grateful for a reminder.

An outstanding feature of the main part of the work is the chapter by W. Ernest Miles on the rectum and anus, but 1200 pages are allocated to the surgery of the upper abdomen. Here the coöperation of A. F. Hurst and R. Sleigh Johnson on the medical side has been wisely enlisted in the chapters on the stomach; and the contribution by A. J. Cokkinis on intestinal obstruction is deserving of special praise. This part of the work might have been improved by careful planning, judicious exclusion of non-essentials, and concise diction; there are too many "lists" of the kind favoured by the experienced examination candidate, which are of value chiefly when they are compiled by himself, and there is some lack of balance in the space allotted to the various organs. The stomach and duodenum occupy 550 pages, while diseases of the colon are dismissed in 30, volvulus and diverticulitis being allotted barely a page apiece. The chapters on ileus and on Egyptian splenomegaly are redundant, and this is not the only example of overlapping and repetition.

The opinions expressed by the several authors are in accord with the best surgical teaching, and this must be the ultimate criterion by which the work will be judged. It is specially to the credit of the editor that very little has been omitted, but it is not always easy to find the reference to a given

subject. Alkalosis, for example, is mentioned only once in the index in reference to infantile pyloric stenosis, though the more important occurrence of alkalosis in adults receives due consideration in the section on the pre-operative treatment of peptic ulcer. The illustrations are well reproduced, but the book might well have been shortened by omitting a large number of pictures with which every undergraduate is quite familiar, and many others which show in unnecessary detail the steps of operations clearly explained in the text. It is to be hoped that the editor may be persuaded in future editions to improve an already good piece of work by ruthlessly cutting down redundant and unnecessary matter so that it may resemble more closely the "friendly book of reference" envisaged in the introduction.

Disorders of Metabolism

Diagnosis and Treatment. By JAMES S. McLESTER, M.D., Professor of Medicine at the University of Alabama. London: Humphrey Milford, Oxford University Press. 1936. Pp. 318. 25s.

METABOLISM is an elastic word and the term disorders of metabolism might be stretched to include the greater part of medicine. The first problem confronting the writer of a text-book on the subject is thus that of selection. He cannot steer clear of the pancreas, for instance, in considering disturbances of carbohydrate metabolism, but one hormone leads to another, and if he is not careful he will end by writing a book on endocrinology. Prof. McLester has resisted this syren of modern medicine, however, and has held to his course. He has also discriminated between common and important conditions like diabetes and obesity, and mere interesting oddities like alkaptouria. The British reader might perhaps feel that too much attention is devoted to gout, which seems to be following typhoid and the red squirrel into extinction in this country. Perhaps the prosperity associated with economic revival will give us back our tophi.

In discussing obesity, a subject which can generally be relied upon to divide the profession into two opposing camps, the one composed of lean rationalists, the other of more rotund mystics, Prof. McLester steers an admirable middle course which should help to reconcile the two factions. His opinion that obesity causes direct cardiac damage will not be generally accepted. Exception must also be taken to the statement that "chronic bronchitis and pulmonary emphysema are occasional accompaniments of obesity, due in part to chronic pulmonary congestion of cardiac origin, and in part to the hindrance which the subcutaneous fat offers to the heat-regulating mechanism with consequent loss of protection against changes of temperature." The gross pulmonary congestion of mitral stenosis does not give rise to emphysema, and it might also be argued that a generous lining of insulating fat might assist the heat-regulating mechanisms to maintain a constant internal temperature. However, there is much still to be learnt about obesity. The insurance companies tell us that the stout are short-lived; the reason is a matter for speculation. The author rightly believes that the rational treatment should be a matter of diet and exercise, and he makes no reference to the drugs which have lately been in fashion, not always with happy results.

The section on diabetes contains a great deal of useful information; Prof. McLester is perhaps overbold in stating that the pituitary can be ruled out of the ætiology of the disease. The modern pituitary is burdened with many functions, real and reputed, but the fact that the diabetes which follows pancreatectomy in animals can be checked by removing the pituitary leaves no doubt that the latter is intimately concerned in normal carbohydrate metabolism. It cannot therefore be ignored in connexion with a state of abnormal carbohydrate metabolism, the cause of which is still unknown.

This book should appeal to the physician who wishes to use the best available methods in investigating and treating cases of metabolic disease. It is essentially practical, and details of technique and of the various diets are fully described. The clear type and the wide spacing between lines make for easy reading.

Bacteriology in Relation to Clinical Medicine

Theoretical and Applied. By M. N. DE, M.B., M.R.C.P. Lond., Professor of Pathology, Medical College of Bengal, Calcutta; and K. D. CHATTERJEE, M.B., Medical Registrar, Medical College Hospital, Calcutta. Calcutta: The Statesman Press. 1935. Pp. 599. 30s.

THIS text-book provides evidence of the strong root that pathological teaching has taken in Indian soil. Designed for senior medical students and for students of public health, it covers the necessary ground very well. Many of the most recent advances in bacteriology are described; these are selected with excellent judgment, and the student should never be in danger of losing sight of the wood for the trees. Naturally the requirements of Indian and other Eastern students are specially considered, and the student of tropical medicine will find this a useful text-book. Protozoology is not included, the authors recognising that it is too big and important a branch of tropical medicine to be treated as a sideline. It would seem ungracious to refer to the fact that the authors occasionally stumble over the niceties of English expression; at worst a venal fault—except that this takes away the finish of an otherwise admirable work. In a new work the small effort required to rectify this matter should be made. The work as a whole is a credit to Indian medical teaching and, we may add, to Indian printers and publishers, for the printing is excellent, and the profuse illustrations, many of them in colours, are beautifully reproduced.

Endocrine Tumours

And Other Essays. By FREDERICK PARKES WEBER, M.A., M.D., F.R.C.P., F.S.A., Senior Physician to the German Hospital, London. London: H. K. Lewis and Co., Ltd. 1936. Pp. 207. 7s. 6d.

WE welcome the publication of another volume of the collected essays from the pen of so wise a medical scholar and philosopher as Dr. Parkes Weber. The main essay from which the book takes its title is written from a clinical standpoint, and is admirably lucid and informative. According to his habit the author is not content to quote merely from his own experience but has drawn extensively from the literature, and no aspect of medicine, simple or complex, seems to have escaped attention. He writes with equal facility on "Change of air," on the one hand and "The theory of the leucæmias as neoplastic mutations" on the other.

The essay on thrombo-angiitis obliterans is especially interesting. It contains an account of a case he first described in THE LANCET before Leo Buerger's publications on this disease. Dr. Weber has had this case under observation for 30 years, and has watched the patient gradually recover from the condition. With characteristic modesty he disclaims all credit for the cure. Not all the essays are confined to strictly medical matters. He has something interesting to say, for example, on Savagery in Myths and Dreams and on Pathological Money. The doctor, anxious to relax after a trying day's work, will find this book sedative without being soporific.

Tropical Diseases

An Epitome of Laboratory Diagnosis and Treatment. By HORACE M. SHELLEY, F.R.F.P.S., M.R.C.S., D.T.M. & H. Eng. Government Pathologist, Nyasaland, East Africa. London: John Bale, Sons and Danielsson, Ltd. 1936. Pp. 81. 2s. 6d.

IN Dr. Shelley's words "this little book is intended to supply the busy practitioner in the tropics with simple details concerning the laboratory diagnosis and treatment of diseases common to those climes. The essentials only are dealt with. . . ." It is inevitable that the author appears to have travelled beyond his reference in certain places and stopped short of it in others. For example, the certain diagnosis of malarial infection depends essentially on the demonstration of plasmodia or pigmented leucocytes, and in the absence of both, no amount or variety of blood counting can help very much; on the other hand, the suggestion that the essential laboratory diagnosis of Japanese river fever rests upon the observation of the fact that "there is a leucopenia" under-estimates the complexity of the problem. The diagrams are poor, especially those on pp. 32 and 33, while those on pp. 14 and 64 give wrong impressions of the relative sizes of the objects depicted. In dealing with methods of treatment Dr. Shelley states that his object has been to emphasise those of proved value rather than others of doubtful benefit, but unfortunately, as he himself says, details of therapy largely reflect personal bias rather than established principles. It is difficult to judge of the extent to which this book may prove useful.

Diseases of the Skin

Third edition. By F. C. KNOWLES, M.D., Professor of Dermatology, Jefferson Medical College; Member of the American Dermatological Association. London: Henry Kimpton. 1936. Pp. 640. 30s.

SOME 14 pages of contents indicate the scope and arrangement of the subject matter of this book, which includes in addition to diseases of the skin those of the appendages and mucous membranes, and the eruptive fevers. Forty-five pages are devoted to syphilis, which in common with the dermatoses is illustrated by a generous number of clinical photographs. The value of these from a diagnostic standpoint is somewhat discounted by their small size, sufficient perhaps for indicating the sites of predilection, but not large or vivid enough to permit of a study of characteristic detail. The need for continuity of treatment in syphilis, which has been emphasised in America for some time past, receives due recognition, and a useful and easily comprehended schedule is provided on pp. 460-61. Well managed too is the article on acne. Some points

in the treatment based on theoretical considerations such as the potassium bromate content of white bread will be new to British readers, while the endocrine treatment of persistent alopecia areata, which originated largely in the U.S.A., is quoted without extravagant claims. With such modern additions it is strange that in the discussion of ringworm of the scalp no mention is made of the thallium acetate method of epilation which in this country has proved most useful in children too young for treatment by X rays. It is not easy to place this work, for while

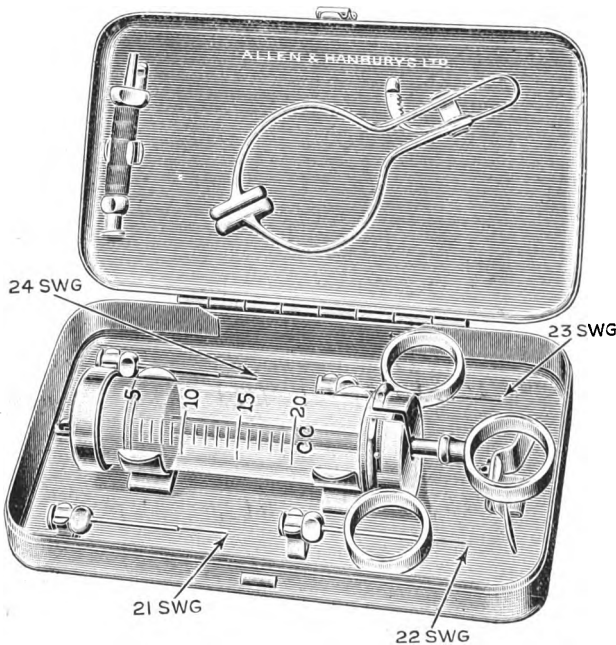
it may be regarded as too large for the busy practitioner, its scope is hardly sufficient to serve the purpose of a text-book.

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NEW INVENTIONS

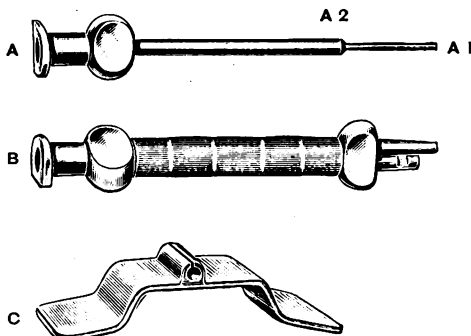
OUTFIT FOR VASOTOMY

WHATEVER objections may be raised to vasotomy in the treatment of acute gonorrhoea, few can object to it as a useful—I consider essential—measure for dealing with infection of the prostate and seminal vesicles and systemic complications arising there-



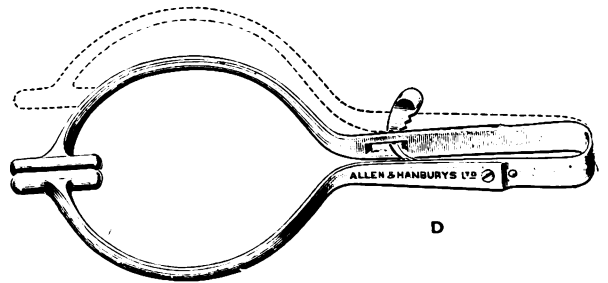
from. An account of the outfit I use for the purpose may therefore be of interest.

The needle (A) is so designed that it reduces to a



minimum the possibility of damaging the intima of the vas. The point (A1) is blunt and has an outside bevelled edge, and 1/2 in. from the point is a shoulder (A2) which prevents the introduction of the needle too far into the lumen. They can be had in four

different calibres (21 to 24 swg). The needle is fitted by a bayonet joint to a 2 in. length of rubber tubing (B) the other end of which fits by another bayonet joint to a 20 c.cm. Record syringe. This secures the absence of wobbling of the needle-point in the lumen of the canal. The bridge (C) through which the needle is passed still further secures steadiness



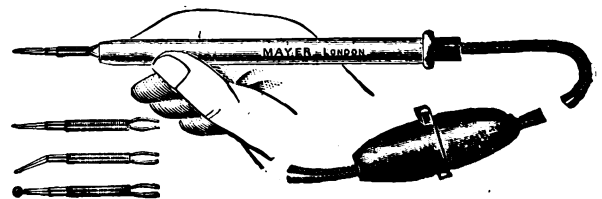
and also holds the needle parallel with and at the level of the lumen of the tube outside the skin surface. The vasotomy clamp (D) will be found very useful for grasping and steadying the vas during incision, and is very easily manipulated.

The outfit, which is neatly contained in a metal case (6 in. by 3 1/4 in. by 1 1/4 in.) as shown in the illustration, has been made for me by Messrs. Allen and Hanburys Ltd. of Wigmore-street, London, W.

J. F. PEART, F.R.C.S. Irel.

AN IMPROVED TYPE OF GALVANOCAUTERY

THE instrument here illustrated is particularly suitable for the treatment of warts, naevi, &c. The holder is about the thickness of a pencil and has obvious advantages over the usual type of instrument. Instead of a press switch on the handle which



in use often becomes unbearably hot, a pear switch is fitted in continuity with the wire flex about 3 ft. from the cautery handle. This switch is held and easily operated by the left hand leaving the right hand free for the careful manipulation of the cautery point.

The instrument has been made to my design by Messrs. Mayer and Phelps, New Cavendish-street, London, W.

R. T. BRAIN, M.D., F.R.C.P. Lond.

THE LANCET

LONDON: SATURDAY, FEBRUARY 29, 1936

WATER METABOLISM IN EPILEPSY

DURING the past few years the field of epilepsy research has been inundated with water. The flood reached its height a year or two ago, and, having damped the ardour of all but a few enthusiasts, has since been receding rapidly, so that it is now possible to take stock of the situation. Apart from a few damp patches, the field seems remarkably unchanged. The idea that epilepsy might have something to do with water metabolism is not new. HIPPOCRATES is credited with the statement that "whoever is acquainted with such a change in men and can render a man humid and dry, hot or cold by regimen could also cure this disease—without minding purifications, spells and all other illiberal practices of a like kind." LENNOX and COBB have aptly paraphrased this as follows: "Whoever is acquainted with physiology and can render a man acidotic, dehydrated and fully oxygenated could also repress this disease, without minding purification of narcissistic personalities, ritualistic empirical diets and all other illiberal practices of a like kind." Both the original dictum and the paraphrase have been frequently repeated, in our own columns and elsewhere, and they stand repetition. But neither the Father of Medicine nor his interpreters would be pleased to see their words construed as meaning that epilepsy is due to waterlogging of the brain. It is true that modern research has confirmed the intuition of HIPPOCRATES in that it has shown that anything conducive to dehydration—be it starvation, a ketogenic diet, or drastic restriction of fluid intake—will often lessen the frequency of fits in the epileptic, and that on the other hand forcing of fluid will precipitate convulsions. But it is a perilous jump from these facts to the conclusion that epilepsy is an expression of disturbed water balance. It would be just as logical, or illogical, to assume that because alcohol induces a state of euphoria, schizophrenia is due to a deficiency of alcohol.

Another source of misapprehension is the fact that the convulsion itself gives rise to severe though temporary dislocations of physiological equilibrium in general and of fluid balance in particular. During and immediately after convulsions the body loses a considerable amount of extracellular fluid, and this temporary dehydration is naturally followed by a reactionary phase of water retention. The body, in short, loses water during fits and recovers it in the intervals. But somehow this has been twisted round into the statement that the body retains extra fluid between convulsions and discharges it during the fit. Epilepsy is therefore due, argues the enthusiast, to retention of water. When he is reminded that

convulsions are not a symptom of oedema, he shifts ground and postulates a local oedema of the brain due to obstruction of venous return. Counter this with the fact that the tension of cerebrospinal fluid is normal in epilepsy and he falls back on local shifts of water between the neurone and its environment. Surrounded thus by the cell membrane he is safe from assault. Nevertheless the onus of proving his hypothesis rests on him; and in point of fact no single metabolic aberration has yet been demonstrated to precede the epileptic fit. The normal activities of the neurone are responsive to changes in its environment, and it is therefore no cause for surprise that its pathological activities can be similarly modified.

But while informed opinion may remain unmoved by inconclusive evidence, it must always leave some impression on the general reader who has neither time nor training to assess it at its true worth. In consequence much of the time and resources of medical research workers must be spent in disproving "theories" which ought never to have been propounded. A recent publication by Dr. H. S. TEGLBJAERG¹ is a case in point. Dr. TEGLBJAERG records the results of exhaustive investigation into all aspects of the relation of water metabolism to epilepsy, during the course of which he has carefully tested the data and criticised the conclusions of his predecessors. The net result of a great deal of expenditure of time, money, and labour is that there is no positive evidence to incriminate water metabolism in the ætiology of epilepsy, but that forcing of fluids, associated with injection of pitressin, may be useful in diagnosing the disease. Such negative inquiries seem inevitable, but one is left with a feeling of regret that the resources at Dr. TEGLBJAERG's command have had to be used to such small gain.

NON-SPECIFIC PROTEIN THERAPY

ABOUT twenty years ago it was shown that the course of typhoid fever is often favourably influenced by intravenous injections of typhoid vaccine.² It was soon found that similar results could be got with *Bacillus coli* vaccine³ or albumose,⁴ and non-specific protein therapy dates from these observations. A great variety of proteins has since been used to treat an even greater variety of conditions, both acute and chronic. The American Council on Pharmacy and Chemistry, believing that there are many proprietary preparations of this type of unproved value, and that the indications for the use of non-specific protein therapy are not widely appreciated, has recently authorised the publication of two informative articles on the subject. In the first of these CECIL⁵ provides a critical review of the whole field. The three proteins most often used in the United States are typhoid vaccine,

¹ Investigations on Epilepsy and Water Metabolism. By H. Stubbe Teglbjaerg. Acta Psych. et Neurol. Suppl. xi, 1936.

² Kraus, R., and Mazza, S.: Deut. med. Woch., 1914, xl, 1536.

³ Kraus, R., Penna, J., and Bonorino, C. L.: Wien. klin. Woch., 1917, xxx., 869.

⁴ Lüdke, H.: Münch. med. Woch., 1915, lxii., 321.

⁵ Cecil, R. L.: Jour. Amer. Med. Assoc., 1935, cv., 1846.

boiled milk, and diphtheria antitoxin, the latter being employed not because of its antitoxic property but because it is an available form of horse serum. CECIL thinks it very unlikely that any of the proprietary remedies offered as substitutes have any virtues not inherent in these substances, but the Gram-positive bacteria such as pneumococci are said to be less likely to cause febrile reactions than Gram-negative organisms such as typhoid bacilli, when given intravenously. It is essential, however, to distinguish sharply between the effects of intravenous and of intramuscular or subcutaneous injections. The two last provoke comparatively mild reactions, and there are very few patients indeed who cannot safely be given them. On the other hand, though such injections do no harm, they very often do no good, and CECIL believes that intravenous injection of typhoid vaccine is not dangerous, provided it is not applied to patients in a state of exhaustion, and that the first dose given is a small one. It is also wise to avoid treating patients who are known to be protein-sensitive, those who have active or quiescent pulmonary tuberculosis, and cases of congestive cardiac failure and hyperthyroidism.

It is extremely difficult to assess the merits of any form of therapy in chronic disorders, especially in those characterised by natural remissions. It is therefore not surprising that opinions about the value of non-specific protein therapy in such conditions as chronic arthritis should be conflicting, though the balance of evidence is in favour of its trial, especially in early cases. CECIL holds that the greatest usefulness of protein injections is in acute and subacute infections, and in these it is usually possible to be surer that benefit is being obtained. The method having been first applied to typhoid fever, there are numerous series of cases on record treated by protein therapy, and with great success. In pneumonia, although the statistical evidence is distinctly in favour of protein fever therapy in Group IV. cases, it is felt that this form of treatment is too drastic, especially as several fatalities have been recorded. In dementia paralytica malarial therapy holds a secure place, but although this is almost certainly a further example of protein therapy, there is as yet no certainty that injections of typhoid vaccine are equally efficient in bringing about a cure. In tabes dorsalis the results are less consistent, and in other diseases of the nervous system relief is the exception. CECIL states that protein therapy should always be considered for cases of acute arthritis, especially for those that do not respond to salicylates. The treatment of inflammatory diseases of the eye—especially acute iritis, uveitis, keratitis, and conjunctivitis—is the subject of numerous reports claiming successful results. In gynaecology, acute and subacute infections of the adnexa have often been treated by foreign proteins, and L. H. STUHLER, of the Mayo Clinic, goes so far as to say that if he were limited to one method of treatment in salpingitis, it would be this. In the treatment of allergic diseases and dermatological conditions reports are more conflicting, and

striking improvement should not be expected. Of especial interest, perhaps, is the use of proteins in the treatment of diseases of the peripheral vessels, for which comparatively little can otherwise be done. G. E. BROWN has described intravenous injections of typhoid vaccine as the best medical measure for the relief of the severe pain of thrombo-angiitis obliterans. N. W. BARKER prefers typhoid H antigen, which when injected intravenously produces fever with fewer rigors than typhoid vaccine. And though the suggested mechanism is not the same, it may not be irrelevant to recall also the impressive results obtained from the use of muscle extract.⁶

A second paper, by HEKTOEN,⁷ deals in more detail with the changes which occur in the organism in response to foreign proteins. The benefit derived bears some relation, he believes, to the degree of the general reaction and of the fever. There is a dilatation of the vessels in the splanchnic area with contraction of the peripheral vessels, and it is this which gives rise to the rigors; later this state of affairs is reversed. At first there is a leucopenia which is followed by a leucocytosis. Numerous other alterations occur in the various chemical constituents of the blood, such as an increase in the proteolytic and lipolytic enzymes. It is surprising that it has not yet been determined whether the normal antibodies and bactericidal constituents of the blood are increased in man in non-specific protein therapy, nor is it known whether in typhoid fever the production of specific antibodies is as great after typhoid vaccine has been given as after a non-specific protein. In some types of disorder, it may be, specific immune bodies are manufactured and assist the natural defences of the body; in others it is possible that the leucocytosis is the important reaction, and in yet others the fever, which by giving rise to vasodilatation floods the infected or injured tissues with antibodies. In vascular disease it is certain that the degree of vasodilatation is of prime importance, and in a sense the treatment here is specific rather than non-specific. There obviously remains a wide field for further research, not only into the practical value of the method, but also into the processes underlying it.

CONGENITAL G.P.I.

SINCE the advent of malaria therapy so much attention has been focused on acquired general paralysis of the insane that the inherited form of the disease has suffered relative neglect. At a meeting of the neurological section of the Royal Society of Medicine on Feb. 20th a clinical demonstration of cases of congenital G.P.I. treated at the Maudsley Hospital was therefore welcome and provided the basis for a lively discussion. Some 27 patients thus afflicted had been under the care of Dr. T. TENNENT during the last nine years. Of these 9 belonged to a group for whom no form of therapy offered any hope, some degree of amentia being present. In the remaining 18

⁶ See Schwartzman, M.: THE LANCET, 1935, 1., 1270.
⁷ Hektoen, L.: Jour. Amer. Med. Assoc., 1935, cv., 1765.

cases the child was normal until the development of the clinical picture of G.P.I.; of these, 14 had received malaria plus tryparsamide, with the result that 5 had improved to an extent which made them fit to remain at home and to assist in household duties—a result as gratifying as it is unusual; 4 had made slight improvement, 2 remained stationary, 1 was in a mental hospital, and 2 had died. The incidence was the same in both sexes; in 16 cases syphilis could be definitely traced to one or other parent, and in 7 one or other parent had G.P.I. (6 fathers and 1 mother). In one of the families there were 3 juvenile victims of G.P.I. The diagnosis was made on a fourfold basis—history, mental picture, and the neurological and serological findings all being considered. The treatment adopted in suitable cases consisted of induced malaria (8 rigors) followed by repeated courses of tryparsamide. The older the age of onset, and the shorter the time during which symptoms had been observed before steps were taken the more favourable appears to be the prognosis.

Another series of treated cases was described by Dr. W. D. NICOL and Dr. E. L. HUTTON in a joint communication from Horton. Over a period of ten years they had 16 such cases (2 boys, 14 girls) of whom 7 were dead. As in the Maudsley series congenital stigmata were comparatively rare, the incidence of pupillary changes was extremely high, and slurred speech was common; fits occurred in half the cases, but none had tabes. All but one of the cases had malaria treatment; salvarsanised serum had been given to 2 patients and arsenical treatment to 4 others, but none had had tryparsamide. Serological findings were positive in every case, and in 9 there was evidence of syphilis in parents, 4 of whom had developed G.P.I. Results of treatment were disappointing; in only one case had the progress of the disease been arrested. Three patients were still alive 15, 11, and 10 years after the onset of symptoms; one of these was now held to be suffering from neuro-syphilis rather than G.P.I. Diagnosis indeed seems to be a difficult matter, since other neuro-syphilitic manifestations such as epilepsy and meningovascular disease cannot always be excluded. In the course of the discussion Dr. J. BRANDER pointed out the pitfalls which are encountered when too much reliance is placed on serological findings, in the adult as well as in the child. Even in young children, moreover, the possibility of acquired syphilis must be borne in mind, though proved instances of this are very rare. D. C. JEANS and J. V. COOKE¹ could find only 34 cases of syphilitic infection acquired between the ages of 2 and 9 in their examination of more than 75,000 children. Some of the family trees of the Horton cases shown on the screen proved to be of great interest and supported Dr. NICOL's plea for the investigation of family histories. Dr. DAVID NABARRO also emphasised the value of the information to be gained from the study of family history. His vast experience of congenital syphilis in

children, of which he discusses another aspect on p. 498 has convinced him that neuro-syphilis is far more common than is generally supposed—probably as high as 50 per cent. He maintains that the early discovery of a positive cerebro-spinal fluid demands energetic antisyphilitic treatment if the risk of G.P.I. occurring in any of these children is to be forestalled.

It is fortunate that congenital G.P.I. is a rare disease, for the general consensus of opinion appears to be that once clinical symptoms have supervened the condition is almost hopeless. Dr. R. M. STEWART confirmed this melancholy verdict as the outcome of considerable experience. W. C. MENNINGER² has reviewed records of 610 cases from the literature in none of which was treatment of any avail. H. W. POTTER³ reports 60 cases which include 6 remissions after treatment. It would appear that these together with the few shown by Dr. TENNENT are the only ones in whom any degree of improvement has been reported. It remains to be seen whether even in those 5 children the amelioration will be maintained.

PROSTIGMIN AND MYASTHENIA GRAVIS

THE nervous system contains at least three types of junction between functionally linked structures: (1) between a stimulus receptor and its afferent neurone, (2) between one neurone and another, and (3) between an efferent neurone and the muscle-fibre or other effector organ which it innervates. The separate activities of each of these structures have one common accompaniment: an electrical ionic shift that can be objectively recorded by means of suitable apparatus and which may be taken as the most reliable indicator of functional activity. A natural inference is that activity passes from each of these structures to the next in virtue of this electrical change—i.e., that transmission of activity across the junction is mediated directly by electrical influence. This simple explanation becomes less satisfactory with every addition to our knowledge of the behaviour of those functional units which embrace both discontinuous structures and the junction between them. So little is yet known of the mode of action of stimulus receptors that we have not yet reached the stage of a simple explanation of the transfer of their activity to their afferent neurones, though LEWIS's suggestion that peripheral excitation of afferent neurones that give rise to pain is brought about by the liberation of histamine or of some pharmacologically similar substance is a plausible one.

To explain the observed facts of spinal reflex physiology SHERRINGTON found it necessary to hypothecate the liberation at the interneuronal junction, or synapse, of two mutually antagonistic substances—excitatory (E) and inhibitory (I)—instead of the simple transfer of electrical instability. These (E) and (I) substances still remain physiological abstractions, but the work of DALE and his collaborators has drawn attention to a

¹ Prepubescent Syphilis, New York, 1930.

² Amer. Jour. Syph., 1935, xix., 257.

³ Psychiat. Quart., 1933, vii., 593.

substance of undoubtedly objective existence—acetylcholine—which appears to provide all that our present knowledge of neuromuscular activity demands of a chemical transmitter, and it is at the moment sufficient to assume that the exciting impulse in the motor neurone causes at this junction the liberation of acetylcholine which in turn excites to activity the contractile elements in the muscle-fibre. Although this is still barely beyond the stage of an hypothesis, not universally accepted, clinical neurology has already found in it a ready explanation for one of its own particular problems—i.e., the nature and the relief of the muscular weakness in myasthenia gravis. This muscular weakness is associated with a form of myogram peculiar to this condition; the prompt and dramatic relief afforded by Prostigmin can thus be actually charted, also the gradual reversion of the myogram to its characteristic pathological form as the effect of the drug wears off and the clinical improvement disappears. There are therefore good grounds for believing that prostigmin, unlike glycine and ephedrine, has an effect in myasthenia gravis which is not merely adjuvant or compensatory, but which is concerned directly with the reversal of the change responsible for the muscular weakness. This pathological change undoubtedly occurs at the neuromuscular junction between voluntary nerve and skeletal muscle. If it is assumed that excitation is normally transferred from nerve to muscle at this junction by acetylcholine, it is to be expected that the change is concerned at some stage with the liberation, the migration, or the exciting action of this transmitter. When it is further demonstrated that prostigmin has also the property of protecting acetylcholine from destruction by the esterase normally present in the blood, its therapeutic value in myasthenia gravis is easy to understand.

In normal persons, according to this theory, the quantum of acetylcholine released by each impulse is immediately attacked and rapidly destroyed by the esterase locally present. The excitation is transferred to the muscle-fibre only when an adequate amount of acetylcholine escapes destruction and reaches the motor end-plate or whatever other structure effects the immediate stimulation of the contractile elements. In the myasthenic patient the weakness of voluntary movements is due either to the smallness of the amount of transmitter liberated by each nervous impulse, or to the over-activity of the destructive esterase, so that the transmitter does not accumulate in quantity sufficient to excite the normal number of muscle-fibres to contraction. Prostigmin presumably relieves this weakness by slowing the rate of destruction of acetylcholine, the effect being achieved either by giving extra protection to the abnormally small amounts produced, or by protecting normal amounts against destruction at an excessive rate. The latter possibility can be discarded in the light of other observations; the former fits in well with the phenomena of myasthenic fatigue as observed clinically and with the characteristic myasthenic myogram. A delay in the synthesis of the inactive precursor of acetylcholine from its

chemical components would account for the experimentally recorded abnormalities of the myogram, but would not account for the clinically observed weakness of the victims of myasthenia gravis; if we are to retain this hypothesis we must therefore make the further assumption that there is delay in the mobilisation of these components to the point where they can be used. The probability that this, and possibly other change, is present in myasthenia gravis is perhaps to be inferred from the fact that the therapeutic effect of prostigmin is limited to the very transitory relief of a symptom and does not include any favourable influence upon the course of the disease.

Another line of approach to the problem has been pursued by Lady BRISCOE, who records the outcome of her investigations elsewhere in this issue. She has introduced an entirely different conception of the essential pathological change responsible for myasthenic weakness. The hypothesis advanced by her, in conjunction with DALE, is derived from the long recognised similarity between the behaviour of a myasthenic patient and that of a curarised muscle-nerve preparation. It seems likely that curarine acts not by reducing the amount of the transmitter (acetylcholine) liberated at the neuromuscular junction, but by raising the threshold for excitation of the muscle-fibre so that a previously effective amount of the transmitter becomes no longer adequate. The question immediately arises: is the weakness in myasthenia gravis due in the same sense to a pathologically high stimulation threshold of the muscle-fibre receptor? If we adopt this view, as Lady BRISCOE has pointed out, the clinical action of prostigmin can still be accounted for, in terms of its esterase-inhibiting action, enabling abnormally large amounts of the transmitter to accumulate in contact with the muscle-fibre and thus to reach a value which is once more adequate in relation to the pathologically raised threshold. But she has shown further that prostigmin has a toxic effect on the muscle-nerve preparation which reduces both the height and the maintenance of contraction produced by repetitive stimulation of the motor nerve, and that this effect is exercised most markedly upon the muscle responses to higher rates of supramaximal stimulation. These toxic effects can be quantitatively antagonised by curarine, but they cannot be explained as due to an opposite effect—i.e., to a lowering of the muscle threshold for excitation—because the anticipated result of such lowering would be to make stimuli of subminimal strength and of any rate of repetition adequate, and to make stimuli effective at a rate of repetition too high for transmission to normal muscle. It would be equally difficult to explain the toxic effects in terms of the esterase-inhibiting action, since the anticipated effect of this would be identical with that of a lowering of the muscle threshold. Moreover, prostigmin given in this way produces, according to Lady BRISCOE, a very definite change in the uprising or tension-increasing limb of the myogram, a change which has no clinical counterpart in myasthenia gravis and for

which no explanation is available. These interesting experiments thus bring us nearer to an understanding of the essential pathological change responsible for myasthenic weakness, but not as yet to any explanation of the mode of action of the drugs which completely relieve this weakness. Any attempt that we may now make at an explanation must take into account additional effects which at present seem entirely unrelated to therapeutic

value. Indeed, so many different phenomena appear to be taking place and so many different varieties of activity have been disclosed in this zone of structural discontinuity between nerve and muscle that we cannot but regret the time when it was possible to think in terms of electrical excitation alone and to picture a succession of subdued sparks jumping across a gap which, the microscope assured us, was very small indeed.

ANNOTATIONS

EXPERIMENTS ON ANÆMIA

THE technique developed by Whipple¹ has proved one of the most useful means of assessing the value of remedies for anæmia. In his experiments dogs are given a standard diet and are maintained at a given level of anæmia by bleeding at regular intervals. The degree of anæmia—about 45 per cent. hæmoglobin—is insufficient to impair the appetite or materially affect the physical activity. The amount of blood which must be abstracted to maintain the anæmia is obviously a measure of the hæmoglobin production, and under the standard conditions the dogs produce 10 to 15 grammes of hæmoglobin a week or 1 to 2 per cent. of hæmoglobin a day. Anti-anæmic substances are tested by adding them to the basal diet and noting the increase, if any, in hæmoglobin production. The rate at which the dogs manufacture hæmoglobin is remarkable. When supplied with suitable amounts of hæmatinic material they may produce an average increment of 4 per cent. of hæmoglobin a day, with a peak output up to 10 per cent.

Whipple defines the optimum dose as the amount of a preparation which is utilised to the best advantage in hæmoglobin manufacture when added to the basal diet. As the dosage is increased beyond a certain point, which varies of course in different animals, utilisation falls off, and ten times the optimum dose gives less than twice the return in new hæmoglobin. The optimum dose of iron by mouth in a dog weighing approximately 15 kg. averages 40 mg. a day, which is equivalent to about 200 mg. in a human being. In the dog it appears to make no difference what soluble iron salt is used and ferric citrate scales are just as effective as ferrous salts. In man it is generally believed that the various preparations of iron differ greatly in availability, the average effective doses of ferrous chloride and iron and ammonium citrate being given as 200 and 1600 mg. Fe respectively.² Another difference between the dog and man is the considerable increase in hæmoglobin production when whole liver is combined with massive doses of iron. Hæmoglobin production in these dogs is likewise accelerated when amino-acids are given along with massive doses of iron. Thus there seem to be substantial differences in response to treatment between the experimental hæmorrhagic anæmia of dogs and human idiopathic hypochromic anæmia. About 35 per cent. of an optimum dose of iron by mouth in the dog is converted into hæmoglobin and about 40 per cent. of the food iron. Elvehjem³ has shown that very little of the iron of hæmoglobin and similar preparations is absorbed from the alimentary tract in rats and Whipple finds that only about 10 per

cent. of it is utilised by his dogs—a result in keeping with the low therapeutic efficiency of organic iron compounds in man. Whipple also studied the effect of intravenous injections of ferric hydroxide. Starkenstein⁴ maintains that trivalent ferric iron is therapeutically inactive, but Whipple found that it was quickly and completely converted into hæmoglobin. Efforts to determine the site of hæmoglobin manufacture met with great technical difficulties, but there is a suggestion that the iron is very rapidly taken up by the bone-marrow.⁵

Whipple has often emphasised the necessity for adequate control periods to obtain stable conditions and the long time taken to exhaust the hæmatinic stores of the organism. The importance of these points is emphasised by work lately done in Denmark⁶ on the production of anæmia in dogs by operations on the stomach and duodenum. The experiments were at first sight disappointing, since nothing resembling pernicious anæmia was produced even though the upper duodenum and the distal half of the stomach were resected—the area from which (according to Meulengracht's observations) the anti-pernicious anæmia ferment is secreted. But in a postscript to the paper it is stated that a year later, after a period of apparent recovery, one dog on which this operation was performed had developed a condition similar to pernicious anæmia.

PROGNOSIS IN THE CONVULSIONS OF CHILDHOOD

A FOLLOW-UP investigation by Dr. N. Faxén,¹ of Gothenburg, has contributed some valuable data on the prognosis of convulsions in childhood. In the period 1922–1931 the children's hospital to which he is attached dealt with 365 cases of attacks of loss of consciousness or convulsions in children. Convulsions immediately preceding death or due to some organic disease such as meningitis or a tumour of the brain were excluded. At the end of 1934 a questionnaire was addressed to the parents of the children, and the answers received form the basis of this study. Among the 365 children were 95 whose convulsions were diagnosed in hospital as epileptic. Only 15 of these 95 children could be said to be psychologically normal and free from convulsions after an observation period of at least three years; and only 9 of the 15 had had no attack since discharge from the hospital. As many as 78 of the 95 children were still subject to convulsions, 36 were mentally defective, 17 were undergoing institutional treatment, and 7 were already dead. Small as is the proportion of 15 to 95, Dr. Faxén insists that provided

¹ Whipple, G. H., and Robschert-Robbins, F. S.: *Amer. Jour. Med. Sci.*, January, 1936, p. 11.

² Witts, L. J.: *THE LANCET*, Jan. 4th, 1936, p. 3.

³ Elvehjem, C. A.: *Jour. Amer. Med. Assoc.*, 1932, xcvi., 1046.

⁴ Starkenstein, E.: *Eisen. Handb. d. exp. Pharmakol.*, A. Heffter and W. Heubner, Berlin, 1934, vol. iii., part 2, p. 682.

⁵ Hahn, P. F., and Whipple, G. H.: *Amer. Jour. Med. Sci.* January, 1936, p. 24.

⁶ Petri, S., Ohlsen, A. S., and Boggild, D.: *Acta Med. Scand.*, 1935, lxxxvii., 14.

⁷ *Nordisk Medicinsk Tidskrift*, Jan. 18th, 1936, p. 81.

treatment is skilled and prolonged, the prognosis in epilepsy beginning with convulsions in early childhood must not be considered as hopelessly gloomy. In another group of 40 cases, in which the convulsions had a psychogenic basis, the follow-up inquiries were unsatisfactory in that only 23 of these children could be traced. By far the largest group was composed of the children whose convulsions were due to some infectious disease. The follow-up study showed that 12 of these children had subsequently developed epilepsy, and 6 had shown themselves to be mentally defective. A comparison of the children in the epileptic and the other groups suggested that after the age of 4 years the prognosis in convulsions becomes progressively worse. The frequency with which they occur has some prognostic significance, for while the convulsions with an epileptic basis are usually isolated and separated from each other by fairly regular intervals, those due to other causes, such as an infectious disease, are apt to recur in frequent bouts.

SCHISTOSOME AND MOLLUSC

In a valuable article¹ entitled "the carriage of schistosomes from man to man, with special attention to the molluscs which are their larval hosts in different parts of the earth," Lieut.-Colonel Clayton Lane reviews, with additions, the most important papers on the subject which have been epitomised in the *Tropical Diseases Bulletin*. He begins by recalling how Leiper and Atkinson in 1915 demonstrated that *Schistosoma japonicum* develops from miracidium to cercaria in a mollusc, thus confirming Miyairi's previous discovery. Owing to war conditions the steps they took to identify the species of mollusc responsible were not perhaps the best possible; the molluscs were not of laboratory growth, and the method used was based upon the differential degree of attraction shown by various species for the miracidia, and upon the examination of fully developed worms in animals infected with cercariae obtained naturally from various species of snails. Nevertheless Leiper and Atkinson were in no doubt that the development of the worms was as they said, and with this conclusion there has been full agreement. Clayton Lane suggests that the best chain of facts which can be offered to support the view that a certain mollusc is the intermediate or larval host of a certain schistosome is that put forward by Gordon, Davey, and Peaston. The snails used by these workers were of laboratory growth, so that unnoted natural infection was impossible; infection was given by miracidia from eggs whose species was certain; and the cercariae coming from the molluscs gave the infection to clean animals, as was clear when worms of full development were seen in the veins. Following up his earlier work Leiper in 1916 showed not only that two sorts of eggs came from worms which, when of full growth, had a different structure, but also that the carriage of the two species from man to man took place in Egypt through molluscs which zoological grouping had placed in different genera.

Clayton Lane next discusses the statement that besides the three blood flukes of which human beings are the optimum host—viz., *S. hæmatobium*, *S. japonicum*, and *S. mansoni*—man is also the harbourer of others. This statement has sometimes been based upon the size and outline of the egg; while sometimes the morphology of cercariae which have come out of a snail has been used to put that mollusc among the larval hosts of a schistosome of

man. He draws attention to several papers on the variation in size of the eggs of a single species in various circumstances, and examines critically many others dealing with differentiation based upon differences in the appearances of eggs. Turning to the morphology of cercariae he states that unhappily there is no agreement about the anatomical details of the cercariae of the schistosomes of man, and he thinks that attempts to say with our present knowledge that cercariae coming from a mollusc are those of a certain species of schistosome, and that that mollusc is the larval host of that species, are of no value. He is forced, therefore, to the decision that at present only *S. hæmatobium*, *S. japonicum*, and *S. mansoni* come into the picture of schistosomiasis in man. The rest of his article is a concise account of the geographical distribution of the schistosomes of man and their larval hosts. Observations on the ecology of the molluscs, with special reference to their control, come in for discussion.

This review by Colonel Clayton Lane is of further interest since, apart from words necessary for biology, parasitology, and medical science, the paper is in basic English, keeping to 850 words in the general list and those in the special lists for science. In this way, the author believes, the information collected in the *Tropical Diseases Bulletin* can be made more easily intelligible to those whose language is not English.

PROGRESSIVE GANGRENE ROUND OPERATION WOUNDS

A RARE complication of operations on the serous cavities is the spread of gangrene of the skin on one or both sides of the scar. The course of the gangrenous process is rather slow, and healing by scar tissue follows gradually in the wake of the ulceration, but the advance of the process is quite relentless, until the trunk may be encircled by the ulcer, and death follows unless drastic treatment is undertaken. During the past six years 5 cases have been reported in this country; of these, 2 have died and 3 have recovered. The usual history is that of the fruitless trial of all types of local application, the onward spread of the gangrene being quite unchecked by these or by antiviral, antitoxin, vaccines, or ultraviolet light. The heroic measure, a wide excision of the edges of the wound, was necessary to ensure complete arrest of the disease and the promotion of healing. This was the treatment adopted in the 3 cases which recovered; it is the recognised treatment in America where the condition has been the subject of much discussion. Excision may be either by the scalpel or by the diathermy cautery. A trench cut an inch or so outside the growing edge of the ulcer will effectually stop its advance, and the sloughing edge can be excised at a future operation. The infective process is in the skin, and it will not advance across scar tissue; it never affects the scar of the operation wound, so that the secret of its arrest seems to be the formation, well outside the area of affected skin, of a line of scar tissue. In the most recent case, reported by H. T. Cox,¹ the nature of the condition was recognised 26 days after the first operation, and the treatment by excision successfully carried out, with complete epithelialisation three months later. The primary operation in this case was for repair of a perforated duodenal ulcer, as it was also in the cases reported by R. Owen-Jones and L. M. Hawksley in 1931,² and by H. J. Nightingale

¹ Trop. Dis. Bull., January, 1936, p. 1.

¹ Brit. Jour. Surg., 1936, xxiii., 576.

² Brit. Med. Jour., 1931, i., 537.

and E. C. Bowden in 1934.³ F. H. Scotson's case, reported in THE LANCET in 1933,⁴ followed operation for an appendix abscess; and A. M. Stewart-Wallace in 1935⁵ reported a case following drainage of an empyema. The gangrenous process may start around the edge of a sinus at the site of drainage, or around one or more punctures made by deep tension sutures. The sinus itself always heals, and there is an immune island of tissue around the scar. Outside this is the denuded base of the ulcer, possibly with granulations covering it; then a slough of varying extent; the blackish gangrenous edge; and, at the periphery, a red, usually very tender, serpiginous margin, raised and oedematous, and largely undermined.

The cause of the gangrene has given rise to much speculation. One difficulty is that secondary infection may render impossible culture of the original organisms. In Owen-Jones and Hawksley's case long-chained streptococci were found invading the tissue, but the peculiar nature of the microscopical appearances led to them being reported as "corresponding with the appearances of granuloma fungoides." The most usual finding is of a combination of a non-haemolytic streptococcus with a non-specific staphylococcus. Stewart-Wallace gives it as his opinion that the streptococcal infection comes from the serous cavity, and that the particular streptococcus at fault is capable of adaptation to aerobic and non-aerobic conditions. The symbiosis of this organism with a non-specific staphylococcus introduced from without produces the peculiar type of skin reaction. He suggests that cutaneous hypersensitivity may play an important part, and this seems likely from the rarity of the complication.

THE DETECTION OF STRYCHNINE

It is a remarkable fact that no sensitive qualitative test, based on the formation of a well-defined derivative, is available for strychnine. The laborious work of Dr. Douw G. Steyn,¹ veterinary research officer at Onderstepoort, South Africa, on the detection of this alkaloid in carcasses and corpses is, therefore, of considerable interest. Authorities on toxicology differ greatly as to the limiting dilution at which the characteristic bitter taste of strychnine can be detected, some placing it as low as 1 in 700,000 and others as high as 1 in 67,000. In this connexion, Dr. Steyn points out, an hour or more should be allowed to elapse between each test since the taste nerves very soon become exhausted. Even with this precaution he himself was unable to detect strychnine in a solution of 1 in 200,000 when only one drop was placed on the tongue, but he could appreciate the bitter taste of 1 c.cm. of the same solution. The most delicate precipitating agent for strychnine seems to be Wagner's reagent No. 1 (prepared by dissolving 2 g. iodine and 6 g. potassium iodide in 100 ml. of water), which, he found, will give a macroscopic recognisable precipitate with one drop of a 1/20,000 solution of the alkaloid, whilst the next sensitive reagent is Mayer's solution, of which the limit is 1/8000. Steyn appears to consider the well-known Otto test, with bichromate or other oxidising agent and sulphuric acid, to be the most delicate colour test for strychnine, but it is not, in his experience, specific, as he obtained from a decomposed liver which was known not to contain strychnine a positive sulphuric-bichromate test and the solution was

bitter to the taste. In order to express a definite opinion as to the presence or absence of strychnine in purified extracts of specimens of organs, it is essential, in Steyn's view, to conduct the following tests: (a) taste test, (b) colour test, and (c) a biological test. For this latter he prefers immature white mice (about 14 days old) to frogs, on grounds that mice are always obtainable and behave uniformly, whilst the sensitivity of various species of frogs differs and some are not obtainable at all seasons of the year. The stability of strychnine in the bodies of animals which have been killed by this alkaloid is still a matter of discussion. Steyn, using Glaister's method of extraction, which he finds the best, was able to detect it in three carcasses of dogs exhumed 10 weeks after death, but in only one of four dogs exhumed 18 weeks after death, and in only four out of eight which had been buried for 11 months.

TREATMENT OF BACTERIAL MENINGITIS

THE wireless appeal on Feb. 24th to any doctor with a patient recently recovered from infection with Pfeiffer's bacillus met with immediate response. It suggested a confidence that the life of a child suffering from meningitis might be saved by some form of serum therapy or immuno-transfusion which may not be generally shared; but the discovery, usually after repeated examinations of the cerebro-spinal fluid, of the infecting organism in bacterial meningitis naturally brings with it the impulse to try specific therapy. A recent analysis by C. J. Tripoli¹ of all the cases of bacterial meningitis admitted to the State Charity Hospital of Louisiana during the past ten years, many of them being under his personal observation, gives little encouragement to the use of serum in meningitis other than the cerebro-spinal form. The total was 468, and among them meningococcal meningitis heads the list with 221 cases (47 per cent. of the total) and 144 deaths, a case-mortality rate of 65 per cent. There were 111 examples of pneumococcal meningitis (24 per cent.), 90 being untyped, and all save one of these proved fatal. From tuberculous meningitis (51 cases, 11 per cent.) there were no recoveries. The remaining 86 cases included streptococcal and staphylococcal infections of varying strains, mixed infections, and purulent meningitis of unknown causation.

In the treatment of meningococcal meningitis (cerebro-spinal fever) six different methods were employed; serum administration was the basis of five. Simple lumbar drainage was used for 14 patients, all of whom died; but since most of them were moribund on admission, the results are not a true index of the value of the method. Many of the patients (130) suffering from cerebro-spinal fever were treated by repeated intravenous, intramuscular, and intraspinal injections of antimeningococcal serum after withdrawal of "as much spinal fluid as possible." Of this group 87 died (a case-mortality of 67 per cent.). Tripoli points out that with the foregoing methods no attempt is made to maintain the normal spinal fluid pressure, and further it is difficult for the serum to reach the ventricles and particularly the more important subarachnoid spaces. Serum injected intravenously does, it is true, ultimately reach the cerebral ventricles but in a very much diluted form. Therefore, in 54 patients, the intracisternal route was utilised alternately with the intraspinal. Of these patients 26 died (case-mortality 48 per cent.). Tripoli describes a modification of the Lyon²

¹ Brit. Jour. Surg., 1934, xii., 392.

² THE LANCET, 1933, i., 80.

³ Brit. Jour. Surg., 1935, xxii., 642.

⁴ Onderstepoort Journal of Veterinary Science and Animal Industry, 1935, v.

¹ Jour. Amer. Med. Assoc., Jan. 18th, 1936, p. 171.

² Lyon, G. M.: Amer. Jour. Dis. Child., 1932, xliii., 572.

"substitution" method of serum therapy, by which serum containing phenolphthalein as an indicator is introduced into the ventricle at the same time as cerebro-spinal fluid is being drained by lumbar puncture, the process being stopped when serum appears at the lumbar site. Tripoli places the patient on his side, the head of the table being raised 9 inches. He then introduces a needle into the basal cistern and a second needle into the lumbar cistern, and allows spinal fluid to escape from both needles. The flow from the basal cistern usually ceases first, and as soon as this happens, the lumbar flow continuing, warm serum containing a phthalein indicator is introduced cisternally. The table is then lowered immediately, so that the foot is 6 inches higher than the head, and the serum is allowed to flow into the cistern until it fills the ventricles and appears at the lumbar tap. At the same time, up to 80 c.cm. of serum is given intravenously and up to 100 c.cm. intramuscularly. Of 19 successive cases treated by this method 8 were fatal (case-mortality 42 per cent.), a result which Tripoli, while drawing no definite conclusions, points out is more favourable than those of other methods. He mentions the satisfactory reports upon Ferry's meningococcal antitoxin, but, pending the completion of his own comparative study, expresses no opinion on it.

The methods employed for the treatment of the 247 cases of meningitis other than meningococcal were many and various. Simple lumbar drainage used in 181 cases resulted in 1 recovery, the organism in this case being *Hæmophilus influenzae* (Pfeiffer's bacillus). Intraspinal administration of chemical agents such as mercurochrome proved to be useless in 7 cases; indeed death occurred so quickly in 4 of them that the chemical employed was suspect. For pneumococcal meningitis, specific and non-specific sera and vaccines were without avail; severe reactions "sometimes causing death" are stated to have attended the use of antipneumococcus serum. Permanent and forced drainage of the basal and lumbar cisterns (L. S. Kubie), or surgical drainage of the focus and replacement of the spinal fluid by non-specific serum with and without intracarotid injection of chemical agents were among the heroic methods employed in other cases in Tripoli's series. It is true that in 4 cases of non-meningococcal meningitis treatment by spinal lavage with non-specific serum and the eradication of primary foci of infection was successful; but, on the whole, the results of therapy in forms of meningitis other than cerebro-spinal fever were almost uniformly bad.

SCIENTIFIC SOCIETIES AND RATES

WHILE the de-rating of hospitals is still awaiting the serious attention of Parliament, a recent case at Liverpool is a reminder that scientific societies can sometimes escape assessment. An Act of 1843 exempted non-profit-making societies instituted for the exclusive purpose of science, literature, or the fine arts, and supported wholly or in part by annual voluntary subscriptions. The Liverpool Amateur Photographic Society, founded in 1853, claimed to come within the statutory exemption. It seemed to be wholly or partly supported by voluntary contributions, and it was precluded from making any dividend, gift, or bonus to its members. The society had a distinguished history, and one of its members had invented the dry-plate process. Counsel for the assessment committee replied that the yearly payments of the members could not be regarded as voluntary contributions within the words of the

Act. Photography, he said, might be a science; to some it was a business, to others a hobby; all that the members of the society appeared to do was to congregate for intercourse relating to their common hobby. The Recorder of Liverpool decided against the society. He held it was not instituted exclusively for the purposes of science or the fine arts, nor did the annual subscriptions and occasional gifts of its members amount to "annual voluntary contributions." According to a dictum of Lord Herschell in the case of the Art Union of London in 1896, members' yearly subscriptions, which purchase them an advantage and are not made as a gratuitous offering for the benefit of others, do not comply with the statutory condition that the society should be supported by "annual voluntary contributions." The Act of 1843, be it noticed, speaks of "science or fine arts." The Royal College of Music obtained exemption from rates in 1898, music being one of the fine arts. The Institution of Civil Engineers had earlier been refused exemption. A professional art, it seems, is not a fine art.

A PLEA FOR COÖRDINATED TOWN PLANNING

THE National Housing Committee, a voluntary band of nine public-spirited men who are working under the chairmanship of Lord Amulree, had already published two important constructive reports¹ before the Housing Act of 1935 came into force. In a further interim report, they point out that this Act marks a definite stage in the evolution of national housing policy, and that if the Government's anticipations are fully realised, one side of the housing problem—the provision of a very large number of dwellings for overcrowded populations—should be solved in measurable time. It is not enough, however, to provide dwellings; it is at least equally important that these dwellings should be built in the right places and in the right relationship to transport facilities, to places of employment and recreation, and to all the other elements which compose the physical pattern of the country's development. Without an efficient system of town and country planning, the national housing campaign may create as many problems as it solves. The committee give examples of fundamental errors both of distribution and of interrelation in the development of housing (municipal as well as private enterprise), of industries, of road and rail transport, and of public services, in various parts of the country. All will agree that the safety and efficiency of the Great West-road as a long-distance fast-traffic artery has been permanently damaged and its amenities ruined by the failure to restrict and plan its frontage development, and those who have recently driven along the Barnet by-pass road on the London side of Hatfield, near the road to Lemsford, will have been horrified by a mushroom development of similar unplanned type. Local authorities have been invested with considerable powers of control, but the powers are permissive, and there is no national and often no regional master-scheme to guide the planning work of individual authorities. The committee's plea is for machinery through which a policy and a broad master-plan for the physical pattern of national development can be worked out at the centre, and imposed as a controlling background and purpose on local schemes and projects. The machinery must operate continuously, for its plans and policies must be readily adjustable to suit changing circumstances. It must

¹ See THE LANCET, 1934, i., 1123, and ii., 148.

command the highest technical skill and be sufficiently independent to obtain its own information by surveys and investigations, to stimulate and, where necessary, to compel the requisite local action to implement its schemes, and to formulate, for the Government's consideration, such proposals as it thinks necessary for the modification and extension of the planning system. In conclusion the committee stress the intimate connexion between their proposals and the efforts which are being made to bring back prosperity to the distressed areas, holding rightly that a well-planned national housing policy should be an effective weapon in the campaign for their rehabilitation.

LONG SURVIVAL WITH METASTATIC MAMMARY CANCER

THE attitude of the medical profession to mammary cancer is, in general, pessimistic, for though no problem in surgery or pathology has been more diligently studied, at any rate during the last twenty years, little improvement in survival rates can be recorded. It is now accepted that the possibility of cure or at least of considerable prolongation of life is dependent, in the main, on the stage the disease has reached when the patient first presents herself for treatment; local recurrence after operation or the development of metastatic growth is therefore regarded as an ominous, if not more or less hopeless, sign pointing to widespread dissemination. A case recently recorded by M. C. Tod and E. K. Dawson,¹ of survival with maintenance of health for 24 years after operation for mammary cancer, in spite of recurrence and metastases, suggests that a pessimistic outlook is not necessarily justified, and that in some patients there may be an undefined and, at present, undefinable factor of "resistance" which prolongs life in spite of widespread tumour development. The patient in this case, a married woman of 47 years when first treated, developed a local recurrence 12 years after radical operation, and subsequently metastases in the opposite breast and axilla, which were treated by irradiation and excision. Tumour tissue, if still present, is now quiescent, and the general condition of the patient is satisfactory. Though such a long survival is probably very rare it provides an encouragement to clinicians, and also suggests that adequate post-operative irradiation of the primary tumour area might in similar conditions serve to prevent local recurrence and the possibility of further dissemination.

PROSPECTS IN THE INDIAN MEDICAL SERVICE

ALTHOUGH no official pronouncement has yet been made it is now a matter of common knowledge that a considerable number of attractive posts in the Provinces will be reserved for European officers of the Service. The Secretary of State for India has recently given a public assurance that the standard of medical aid by European doctors for European civil officials and their families in India will be maintained. For the purpose of honouring this undertaking, and also of providing a war reserve of European medical officers, it has been found necessary to reserve for European members of the Service a number of specialist clinical posts and civil surgeoncies in the Provinces, in addition to a considerable number of posts in the Foreign and Political department. Apart from the posts which have been specifically reserved for European officers there will also be many clinical, research, and public health

appointments for which all I.M.S. officers will be eligible. It has been asserted indeed by responsible people that the prospects of highly qualified recruits to the Service have never been better than they are at present. Although some of the prize appointments will be open only to men with special qualifications there will be excellent prospects of attractive careers both in military and civil employment for men of good all-round attainments. In view of the number of recruits likely to offer themselves after an official announcement young graduates who are thinking about going to India may be well advised to lose no time in making inquiries about the conditions of life and work in the I.M.S. An important point which has been overlooked by many candidates for commissions in the military services is that permanent commissions are given at the outset to all who join the I.M.S., so that unless the officer himself prefers to retire with a gratuity after a few years he automatically retains his commission, instead of finding himself in the position of an applicant for a permanent commission after several years of temporary service. We are informed that in the other military medical services less than half of those who obtain temporary commissions are likely to be retained after their first contract has expired. Many young graduates have entered the I.M.S. with the intention of taking the gratuity for which they become eligible after six years, but few exercise their right to retire; this fact speaks for itself. In the column containing details concerning the Services information is given as to application for commissions.

At the Royal College of Physicians of London on Thursday, March 5th, at 5 P.M., Dr. R. A. McCance will deliver the first of his Goulstonian lectures on medical problems in mineral metabolism. His second and third lectures will be given on March 10th and 12th.

Dr. R. Kuczynski, formerly director of the statistical office, Berlin-Schönberg, is giving three lectures at University College, London, on March 3rd, 6th, and 10th, at 5.30 P.M. His subject will be Recent Population Trends, and Lord Dawson will take the chair at the first lecture.

King Edward's Hospital Fund for London have issued a revised edition of their pamphlet which gives particulars of the provision made for the professional and middle classes at voluntary hospitals in London. This shows a substantial increase in the number of beds for paying patients, as compared with the accommodation available in 1928, when a special committee of the King's Fund inquired into the situation. The total number is now 1997 at 108 hospitals. It should be emphasised that the increase in the number of pay-beds is in addition to an extension of the accommodation for patients in the ordinary wards of the hospitals. This pamphlet gives full particulars of the charges at each individual hospital, and copies may be had from Messrs. Geo. Barber and Son Ltd., Furnival-street, E.C. 4, price 3d., post free.

CONGRESS ON FEVER THERAPY.—As already announced, the first International Congress on Fever Therapy will be held in New York City from Sept. 29th to Oct. 3rd. It is suggested that an English committee should be formed to collect reports which have appeared in this country, and all those who have information which they wish to be brought forward in New York are invited to write to the medical secretary, the International Clinic, Sherwood Park, Tunbridge Wells.

¹ Surg., Gyn., and Obst., January, 1936, p. 90.

PROGNOSIS

A Series of Signed Articles contributed by invitation

XC.—PROGNOSIS OF CONGENITAL SYPHILIS

In discussing the prognosis of congenital syphilis it is necessary to consider (a) the outlook for an affected patient, and (b) the history and course of the disease itself.

Outlook for an Affected Patient

This depends upon several factors: (a) the severity of the disease; (b) the age of the patient when the disease is first diagnosed and adequately treated; and (c) the adequacy of the treatment given.

SEVERITY OF THE DISEASE

As a general rule the more recent the infection in an untreated mother the more severe is the infection in the infant, and occasionally an infant is born so heavily infected suffering, for example, from syphilitic pemphigus or syphilitic nephritis that it dies within a few days or weeks of birth, in spite of the best nursing and antisyphilitic treatment one may give it. If, as is usually the case, the infant is born apparently healthy, and shows signs of the disease during the first four or five weeks of life, even though the rash be extensive and severe and be accompanied by much nasal catarrh with consequent snuffles, life can usually be saved by appropriate treatment and good nursing. In my experience, the nursing is of importance, as great as, if not greater than, the antisyphilitic treatment itself. If the infant's strength is to be maintained for example adequate nourishment is essential. A syphilitic baby whose nasal passages are blocked with discharge from a diseased mucous membrane is unable to take its feed either from the breast or from a bottle. The toilet of the nose and mouth should be rigorously attended to before the feeding is started by wiping away all mucus with moistened swabs of cotton-wool, and the utmost patience is needed in feeding. It may take as long as two hours to get the baby to take a feed of two ounces, but recovery may depend upon perseverance in this respect. Since constant attention to the rash on the body and face is also essential, it can be readily seen how a bad case of congenital syphilis may occupy a nurse's whole time for several weeks. I have had several little patients with disease of such severity (one or two of them with oedema from nephritis) as to make the prognosis seem almost hopeless who nevertheless made a good recovery and appeared to be well several years later.

At the present time severe cases of congenital syphilis seem to be less common than they used to be. This may be due to a natural diminution in the pathogenicity of the spirochete and/or to the effect of a certain amount of treatment of the parents. The symptoms may be vague and inconclusive, such as malnutrition, pylorospasm, anaemia, and so forth, and the infant who fails to respond to ordinary treatment may at once improve and eventually be cured if the presence of syphilis is suspected and confirmed, and treatment is pursued vigorously.

AGE OF THE PATIENT WHEN THE DISEASE IS FIRST DIAGNOSED

This factor is of prime importance in prognosis. Provided that an infant is not overwhelmingly infected by the spirochete, adequate treatment started during the first three to six months of extra-uterine life and given over a sufficiently long period

will result in a complete cure in almost all cases. This statement, however, raises questions to which different paediatricians and syphilologists will give varying replies; notably (a) what is adequate treatment? (b) How long should treatment be continued? (c) What criterion of cure should be adopted?

(a) *What is adequate treatment?*—Certainly the time-honoured treatment with mercury cannot be relied upon for a cure except perhaps of an occasional very mild infection in a child whose father had contracted the disease many years previously and had had some treatment for it. I have seen a few cases of this kind. The recognised treatment to-day is injections of arsenicals together with mercury (by mouth or inunction) or injections of bismuth. Some authorities rely on bismuth alone. In many German clinics congenital syphilis is being treated solely by the oral administration of spirocid (stovarsol, orarsan, acetarsone) with, it is claimed, successful results.

(b) *About the duration of treatment* no stereotyped rule can be given though certain general principles may be followed. Some authorities give at least two years' treatment; Tytler Burke recommends five years' treatment which is in my view unnecessary as a routine, and must prove difficult to apply in practice. So long a course of treatment must imply a number of defaulters. On account of the possible psychic effect of the weekly visits to the clinic and of the discomfort or pain associated with the injections—and it is remarkable how even young infants seem to remember their previous experiences directly they come into the injection room—I decided at one time to curtail treatment as much as possible, and gave one complete course of eight arsenic injections after the Wassermann reaction had become negative. This seemed to be satisfactory in some cases, but in others there was a serological relapse and further treatment had to be given; so my present practice is to treat for at least two years, with intervals of one month between the courses, provided the Wassermann reaction in blood and spinal fluid is negative during the whole of the second year and there are no symptoms of the disease. If the Wassermann reaction and flocculation tests are positive, treatment should be continued through a third and if necessary a fourth year.

(c) *The criterion of "cure."*—A negative blood test and a normal cerebro-spinal fluid together with absence of all clinical manifestations of active syphilis for a period of years is to be aimed at, and can usually be attained in the case of infants who have been adequately treated. In older children, who first come under observation and treatment at the age of, say, five to ten years, the prognosis is not so good, because even although the blood serology may have proved satisfactory, there is no guarantee that later manifestations of the disease may not arise. I have seen interstitial keratitis in children whose blood Wassermann had been negative for four and six years and who had shown no sign of active disease at any of their annual examinations since the Wassermann test was first found to be negative. Some authorities go so far as to say that congenital syphilis in older children can never be regarded as cured. Personally I think this extreme view is too pessimistic, but a follow-up for at least ten years and preferably until adult age is certainly desirable. This often proves a difficult matter, and necessitates in institutions an efficient social service organisation.

ADEQUACY OF THE TREATMENT GIVEN

A young child who shows only a mild infection because the disease in the parents is not recently acquired or because the mother had some treatment during pregnancy will probably be cured after one year's thorough treatment. Older children, provided they have no gross vascular or organic lesion of the central nervous system, appear to make a good recovery with adequate treatment, but this may have to extend over four or more years and necessitate the giving of 15 to 20 grammes of arsenicals in forty or fifty injections as well as malaria therapy in Wassermann-fast and positive cerebro-spinal fluid cases. The most tragic cases are those of congenital neuro-syphilis which are not diagnosed until an encephalitis or a hemiplegia draws attention to the patient's condition. The prognosis in such cases is often hopeless as regards life; there is progressive mental deterioration involving a stay in a mental hospital for several years where life may be prolonged by treatment, though there is no question as to the outcome of the disease. Children with a syphilitic hemiplegia will be permanently disabled, though if the blood and spinal fluid can be rendered permanently negative, their lives may be saved.

Special manifestations of congenital syphilis, such as periostitis of the long bones, interstitial keratitis, gummatous lesions of the skin or mucous membranes, hæmoglobinuria, and anæmia, respond readily to prompt antisyphilitic treatment, but the ultimate prognosis as regards cure will depend upon the factors already considered.

History and Course of the Disease

Although in the eighteenth and nineteenth centuries a few physicians recommended the antenatal treatment of expectant syphilitic mothers to protect the child, it was not until the discovery of "606" by Ehrlich and Hata in 1909 that the prevention of congenital syphilis was seriously considered. Since that time an ever-increasing volume of evidence has been accumulated to show that adequate treatment of the expectant mother will fully protect her child in a very large percentage of cases, as high as 95 per cent. according to N. R. Ingraham (*Amer. Jour. Syph. and Neurology*, October, 1935, p. 556), and even if the infant shows signs of congenital syphilis early and appropriate treatment will cure it.

Knowing as we do how difficult some cases of the disease are to diagnose, and also that in older children a "cure" may take four or more years to attain, it behoves us to take all possible steps to prevent the disease. Women who receive treatment at the ordinary clinics should be warned to apply for further treatment as soon as they realise that they have become pregnant. All women attending antenatal clinics should have a Wassermann test, and if found positive, should be treated by injection. In my view the ideal to be aimed at is a blood test for every pregnant woman; if it were realised that this was the usual practice, no difficulties would arise. Congenital syphilis would be almost non-existent after the lapse of a generation; many stillbirths would be prevented; many children who are now doomed to die young, after some years of miserable existence in mental homes, and others who perforce lead incomplete lives owing to physical disabilities, would be spared to live useful lives.

DAVID NABARRO, M.D., F.R.C.P.,

Director of the Pathological Department and Medical Officer in Charge of the Venereal Diseases Clinic, Hospital for Sick Children, Great Ormond-street.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Capt. Sheldon F. Dudley, O.B.E., M.D., F.R.C.P., to rank of Surg. Rear-Admiral in the vacancy caused by the retirement of Surg. Rear-Admiral J. S. Dudding, C.B., O.B.E., on relinquishing command of the R.N. Hospital, Plymouth.

Surg. Rear-Admiral Dudley, at the age of 52, has been 30 years in the Royal Navy, having been appointed Surg. Lieut. Commander in 1914, and Surg. Captain in 1929. In *THE LANCET* of May 11th, 1935, we noted his appointment as Deputy Director-General.

Surg. Lt.-Comdrs. H. J. McCann to *Bee*, and E. B. Pollard and J. C. Souter to rank of Surg. Comdr.

ROYAL NAVAL VOLUNTEER SERVICE

Surg. Lt.-Comdr. R. J. Matthews to *Royal Sovereign*.
Proby. Surg. Lt. R. W. G. Lancashire to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS

Short Serv. Commissions: Lt. (on prob.) J. McN. Lockie is restd. to the estab.

Among the results announced of the examination (in written subjects) of officers with a view to promotion in the Regular Army and Indian Army, which was held in India and Burma in October last, are the following successful candidates: Major W. A. D. Drummond, Capt. D. Bluett, and Capt. R. J. G. Hyde.

The War Office announces that applications are invited from medical men for appointments to commissions in the Royal Army Medical Corps. Candidates will be selected for commissions without competitive examination and will be required to present themselves in London for interview and physical examination on or about April 23rd next. Further information may be seen in the advertisement which appeared in *THE LANCET* last week (p. 52), and full particulars may be obtained on application to the Assistant Director-General, Army Medical Services, The War Office, London, S.W.1.

REGULAR ARMY RESERVE OF OFFICERS

Capt. F. W. Oldershaw resigns his commn.

TERRITORIAL ARMY

Lt.-Col. J. L. Hamilton, M.C., T.D., to be Bt.-Col. and vacates comd. of 167th Fd. Amb.

Lt.-Col. W. A. Lethem, M.C., to be comd. 167th Fd. Amb.

Maj. A. C. Haddow, T.D., to be Lt.-Col.

supernumerary for service with O.T.C.: Maj. R. B. Green (empld. Durham Univ. Contgt. (Med. Unit), Sen. Div., O.T.C.) resigns his commn. and retains his rank, with permission to wear the prescribed uniform.

Capt. A. T. Fripp resigns his commn.

Lts. H. F. Apthorpe-Webb, R. I. Hyder, E. C. Murphy, and F. V. Allen to be Capt.

F. N. N. Roberts (late Flight-Lt. R.A.F.) to be Lt.

Lt. M. Ellis resigns his commn.

ROYAL AIR FORCE

RESERVE OF OFFICERS

Special Reserve: C. W. Kidd is granted a commission as Flying Officer.

INDIAN MEDICAL SERVICE

Lord Linlithgow, Viceroy-Designate of India, has appointed Major H. H. Elliot, M.B.E., M.C., F.R.C.S. Edin., I.M.S., to his personal staff.

The promotion to the rank of Maj. of the undermentioned officers is confirmed: A. Tait, G. P. F. Bowers, J. S. Riddle, J. E. Grey, S. Smyth, M. H. Wace, R. L. Frost, J. C. Drummond, D. MacD. Fraser, J. F. Shepherd, K. S. Fitch, and S. C. H. Worseldine.

J. M. F. Byrnes and W. J. Young to be Lts. (on prob.).

There will be a selection of recruits early in April and thereafter at intervals of about three months. A memorandum of conditions of service can be obtained from the secretary, Military Department, India Office, Whitehall, London, S.W.1, and any who are interested in the matter should consult personal friends who are actually serving in the Indian Medical Service or apply for an interview with the medical adviser, India Office, Whitehall, London, S.W.1.

SPECIAL ARTICLES

PAYING PATIENTS IN HOSPITALS PROBLEM OF GLOUCESTERSHIRE ROYAL INFIRMARY

A SPECIAL meeting of the governors of the Gloucestershire Royal Infirmary was called a week or two ago to consider the conflicting interests of the workpeople's contribution scheme and the medical staff. After a long discussion the following resolution, proposed by the chairman, Mr. Stamford Hutton, was adopted by 29 votes to 24:—

That it be an instruction to the weekly board to investigate the best means of meeting the wishes of the medical staff with regard to (1) the limitation of persons attending as out-patients to those whose means are insufficient to enable them to obtain as private patients the advice and treatment required; (2) the setting up in connexion with the Infirmary of paying wards freed of any restrictions as to income—and to report thereon to the general committee.

Speaking to this resolution, Mr. Hutton said that, while on the one hand the honorary medical staff had good grounds for complaint about hospital abuse, the committee in charge of the contributory scheme had an idea that the medical staff were seeking to exploit this scheme in their own interests. The staff were convinced that stricter supervision was needed in order to prevent members of the scheme from getting free treatment in the out-patient department when they could afford to go to private doctors. This was an accepted principle of the hospital; request was set out in the printed annual report that the hospital subscriber should inform himself of the circumstances of the patient whom he recommended for admission. No contributory scheme should be allowed to alter the basis upon which the institution was run—namely, for those who had not the ability to pay for their cure. While the hospital authorities did not make any charge for treatment they were entitled to recover overhead expenses. The medical staff contended, and Mr. Hutton said he agreed with them, that some limit ought to be placed upon the income of the contributors. This was done at other institutions of the kind. On inquiry he found that of 50 hospitals with a similar scheme in 33 there was an income limit of £5 per week; 44 of the 50 made some inquiry into the means of contributors who applied for hospital care. The abuse of the out-patient department was, Mr. Hutton added, not restricted to contributors of the scheme. Turning to the question of paying wards, admission of private patients to these was limited to those with incomes below £400 for a single man or woman, below £500 where there was a family. The medical staff asked to have the income limit done away with. Again, from inquiries he had made he was in a position to state that 39 of 53 hospitals in the provinces admitted private patients irrespective of their financial position. They had been reminded that the Infirmary had a waiting-list of 116; this was a matter for regret, but he felt sure that no reasonable increase in the number of beds would diminish this list because the hospital spirit had become so prevalent among those who wanted to go into the ordinary wards that without a close scrutiny of income they would never be able to keep within the limits. Unless they abolished the income limit for paying patients Mr. Hutton felt they were not making medical practice sufficiently attractive to induce the best class of medical men to settle in the

district, and the standard would go down. Hospitals were getting more and more expensive and delicate machinery and appliances which required men who had been trained to use them. When the paying wards were set up in 1925 it was hoped that they would not interfere with nursing-homes, but that hope had not been verified.

In his reply, Mr. W. C. Oxenham, chairman of the workpeople's hospital committee, said there was some reason for the appointment of an almoner to see that consultations were not obtained by people who could afford to pay, but he was doubtful whether the doctors should receive a percentage of the contributions of the workpeople, at all events not 25 per cent., and he doubted whether the paying wards had seriously diminished the doctors' incomes, as examination of the figures showed that last year they received some 60 per cent. of the income from the wards. If the doctors were permitted to charge what fees they liked, could anyone, he said, see people of moderate means ever getting into the wards? The provision of nursing-homes for people with affluent means was still a business proposition.

Speaking on behalf of the honorary medical staff, Dr. A. Alcock said that in his time the number of beds at the hospital had increased from 80 to something like 200, which meant a great deal more work for the staff, and it could not be seriously contended that this big increase came from people who were destitute of means to pay. Times were surely not as bad as that. There was no doubt that the doctors' private practice had declined because of the workpeople's contribution scheme. Is it fair or right, he said, to expect the doctor to treat for nothing a man earning £5 a week? Nursing-homes certainly were now not business enterprises.

After a lively discussion in which it was stated that, if the doctors' proposals were accepted, collectors for the hospital scheme would be in an embarrassing position and scores of people would stop contributing, the chairman's resolution was adopted.

MEDICINE AND THE LAW

Alleged Negligence in Hypodermic Injection

THE Privy Council dismissed the appeal of a doctor last week in *Caldeira v. Gray*, where the Supreme Court of Trinidad, after a hearing which lasted several weeks, had awarded the patient £864 3s. 4d. damages for negligent treatment. The negligence was alleged to have occurred in hypodermic injections of quinine in the right buttock. It was said that the needle had been so unskillfully inserted as to injure the sciatic nerve. The plaintiff complained that, immediately after he got up from the bed on which he lay while the injection was made, he walked with a dropped right foot, and that the disability had continued ever since. There was a great volume of medical evidence taken in the Trinidad Court; it had been exhaustively analysed by the trial judge and the Privy Council did not attempt to go through it all again. Each side had given its own explanation of the injury. The patient said that either the needle pierced the sciatic nerve or else the injection was made so close to the nerve that the quinine permeated into the nerve; he had no symptoms of foot-drop before the injection. The trial judge accepted this explanation, observing that it was fair to infer that the injection caused, or

contributed to, the foot-drop. The doctor explained the injury by saying that the patient had suffered from latent alcoholic neuritis before the injection and that the alcoholic toxins in the patient's system were lit up and precipitated by the shock of the injection. There was, however, no definite evidence of the existence of the latent alcoholic neuritis; the patient was willing to confess that he enjoyed an occasional "spree," but no witness put the case for alcoholism any higher than that. The medical witnesses who gave evidence on behalf of the doctor during the Trinidad hearing could claim no actual experience of latent alcoholic neuritis precipitated by shock; they agreed that such a condition was rare and they were unable to cite a single authentic case which lent full support to the theory. Thus the defendant doctor's explanation could be described by the trial judge and by the appellate tribunal as resting on mere speculation. It presupposed alcoholism in the patient and it required the concurrent existence of two conditions—namely, the existence of latent alcoholic neuritis and the flaring up of the neuritis upon so slight a shock as the injection would cause. The Privy Council considered that the concurrence of these two conditions was, on the evidence, highly improbable. It was argued for the doctor that an experienced practitioner could not have made the cardinal and elementary blunder attributed to him by the patient. Lord Alness, who delivered the judgment of the Privy Council, recalled that there were many instances of signalmen and engine-drivers of experience who on occasion neglected their duty. Their lapses illustrated the principle that familiarity might breed contempt and that an ordinary practice sometimes lacked the constant care which the circumstances demanded. Be that as it may, the judgment declared that the patient's explanation of his disability, supported by the medical evidence which he adduced, had not been displaced by evidence on the other side. The case for the plaintiff was clear, simple, and straightforward; the case for the defendant doctor was speculative, theoretic, and unconvincing.

Although the Privy Council thus tended to express its own opinion upon the merits of the claim, the appeal was not a re-trial. The Trinidad Court had carefully and dispassionately weighed the two conflicting theories and had reached a clear conclusion of fact in favour of the patient. It is not the practice of the Judicial Committee of the Privy Council to reverse a conclusion of fact based upon adequate evidence. The principle is the same as that which was decisive not long ago in the House of Lords case of *Powell v. Streatham Nursing Home*. The trial court has an overwhelming advantage over the appellate tribunals in that it has seen and heard the parties and their witnesses.

Professional Libel Action Settled

Dr. A. M. Simpson's libel action, claiming damages against the eight doctors constituting the medical committee of St. Paul's Hospital, Endell-street, W.C., and a subcommittee of one of the departments of the hospital, was settled in Mr. Justice Macnaghten's court last week. The plaintiff, for many years honorary surgeon at the hospital, had attended before a subcommittee set up by the committee of management to inquire into part of the hospital's work. His comments and criticisms at this inquiry became known to other members of the staff. The defendants drew up replies to his criticisms before the committee had made any report. These replies imputed personal motives to the plaintiff. The

combination of his critics and the publication of the statements about his motives resulted in his not being re-elected to the position of senior surgeon of the hospital. Such was the account given by his counsel, Sir Patrick Hastings, in announcing the settlement of the case and the withdrawal of all imputations. Mr. Norman Birkett, for the defendants, handsomely agreed with what had been said, and the judge pronounced his benediction. If there must be libel actions between professional men, the best kind of libel action is one which is happily settled before witnesses are called. It is profitable to the bar if, when once briefs have been delivered, the presentment of the case in court can be concluded in a few minutes and in the easy atmosphere of mutual compliments. Would it not be profitable to the medical profession if there were some earlier method of composing differences with less expense and less publicity?

AUSTRALASIA

(FROM OUR OWN CORRESPONDENT)

POST-GRADUATE WORK IN NEW SOUTH WALES

IMPORTANT changes have taken place during the last few months in the organisation of post-graduate work in New South Wales. Occasional courses for graduates have been held in Sydney since 1900 by the University and by the New South Wales branch of the British Medical Association, which provided teaching and instruction for its members by means of lectures and clinical meetings. In Victoria, a lead had been given by the appointment of the Melbourne Permanent Post-Graduate Committee, and in 1929 the New South Wales branch formed a standing committee of its council for the purpose of organising post-graduate work in New South Wales. This standing committee showed that wider representation and scope and the complete control of its own funds was important for the proper carrying out of its function. Accordingly, in September, 1932, the branch founded an autonomous body which was known as the New South Wales Permanent Post-Graduate Committee. Under this committee, considerable advance was made and post-graduate instruction in medicine began to become regular and definite. After three years' working it became apparent that still wider scope was required and that a close association with Sydney University was essential. After several conferences had taken place with the University, the senate, on Oct. 10th, 1935, adopted a new by-law which had been approved by the Governor, and the Executive Council, establishing a committee to be known as the New South Wales Post-graduate Committee in Medicine, and on Nov. 4th, 1935, the members of this new committee were appointed. The old committee went out of existence on Nov. 30th, 1935, and all its funds and functions, including any matter which that committee had undertaken or authorised, taken over by the new committee. The by-law of the University that constitutes this body provides for a fund for the promotion of post-graduate education, study, work, and research, and for the advancement of the art and science of medicine. The Committee consists of the chancellor, the deputy-chancellor, the vice-chancellor, and the dean of the faculty of medicine as ex-officio members, representative members appointed from the faculty of medicine, two from the New South Wales branch of the British Medical Association, and from the honorary medical staffs of a number of metropolitan

hospitals. Except for the ex-officio members or a member representative of the faculty of medicine, no person can be a member of the Committee unless he is a member of the British Medical Association, and all must be active members of the body which they represent.

After a review of the hospital position in Sydney, the Permanent Post-graduate Committee, during its last months, approached the Minister for Health in Sydney with a request that special accommodation should be provided for graduate teaching in Sydney. As a result of this, the Government has decided to reconstitute the Prince Henry Hospital, Sydney, as a post-graduate hospital. This hospital, which will have 1100 beds, has hitherto been completely under government control. This will cease and the board will be controlled by a committee consisting of a number of business and medical men, on which it is proposed to give representation to the University of Sydney, the Royal Australasian College of Surgeons, the Association of Physicians, and the New South Wales Government. A Bill for this purpose will be brought forward shortly by the Minister for Health.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

THE ROYAL MEDICAL SOCIETY

Dr. S. A. Kinnier Wilson was the guest of the evening at the annual dinner of the Royal Medical Society which was held in the hall of the Royal College of Surgeons of Edinburgh last week. Dr. A. M. McFarlan, the senior president, presided over a company of about 120, and the other presidents were Dr. H. M. Adam, Dr. A. F. Barron, and Dr. R. T. Campbell.

In proposing the toast of the guest of the evening, the chairman welcomed Dr. Kinnier Wilson as a former president of the society and paid a tribute to his many contributions to neurology. Dr. Kinnier Wilson, in his reply, said he would like to pass on a few lessons he had learned in the 33 years that had elapsed since he had occupied the presidential chair. One was "Never show surprise"; another, "Never say the same thing twice to a patient"; a third piece of advice he offered was, "Never believe what the patient says the doctor said"; and a fourth, "Be decisive in your indecision." If doctors did not know what a disease was they should know exactly what their reasons were for not knowing. A further piece of advice was: "Never take a meal with your patients." In proposing the toast of the Royal Medical Society, Dr. Wilson said that it was at the society's meetings that he first learned to stand on his feet, to face criticism, and to think medically; it was there that he got his first glimpse of the real medical world. The society had a marvellous history of nearly 200 years; it was old, but ever new, as it was conducted by generations of new men every year. Those who had been active members in the past were proud to think that they were once part of that great wave, sweeping onwards.

Dr. H. M. Adam, who replied to the toast, referred to the preparations which are being made for the celebration of the society's bicentenary next year. The bicentenary fund now amounts to £1500, and the Royal Colleges have demonstrated their friendship to the society by their generous contributions. He thanked the College of Surgeons for allowing the society to hold their dinner in the college hall, and drew attention to the fact that on one occasion, over a hundred years ago, the hall of the College of

Surgeons was in such a dilapidated state that the members of the College were glad to have permission to use the hall of the Royal Medical Society.

NEW GLASGOW CLINIC

The Lansdowne Clinic for Functional Nervous Disorders at 400, Great Western-road, Glasgow, was inaugurated at a meeting held last week. The clinic is under the management of the directors of the Royal Mental Hospital and its function is to supplement the work carried out by the psychiatric clinics already working in Glasgow. Patients will be seen at the new out-patient clinic, by appointment, only on request of their family physician, for consultation or treatment, and will be allocated to a member of the medical staff who will arrange for any subsequent interviews that may be required, and who will have charge of the case throughout in co-operation with the family physician. It is hoped that the clinic will gradually develop into something much larger to meet the great need for the treatment of minor nervous disorders. Prof. D. K. Henderson, of Edinburgh University, emphasised the value of clinics such as these. He thought it would have a large social and economic value and should do much to relieve those who are nervously ill. Their chief work was preventive and it would often enable the breadwinner of a family to carry on his daily occupation with the aid of the treatment he received.

IRELAND

(FROM OUR OWN CORRESPONDENT)

THE IRISH FREE STATE MEDICAL UNION

The first meeting of the central council of the Irish Free State Medical Union was held in Dublin on Feb. 20th, with Prof. T. G. Moorhead in the chair. The chief business of the meeting was to sign the memorandum and articles of association of the Union, and for the signatories to constitute themselves the central council. According to the articles such of the subscribers to the memorandum as shall be members of the council of the Irish Medical Association or of the Irish committee of the British Medical Association, resident in the Irish Free State at the date of registration of the Union as a company, shall form the first central council. Such council will hold office until the termination of the annual general meeting of the Union to be held in 1936, and its members will be eligible for re-election. There were about thirty members present, and after the signing of the memorandum and articles a general discussion took place on the steps to be taken to render the Union effective. Dr. John P. Shanley was appointed hon. secretary of the Union and Mr. C. MacAuley and Dr. Robert J. Rowlette were elected joint hon. treasurers.

A NEW FEVER HOSPITAL FOR DUBLIN

It has been generally known for some time that the Hospitals Commission favoured the establishment of a new hospital for infectious diseases in or near Dublin, in which the existing Cork-street Fever Hospital would be merged. The recommendation of the Commission has been approved by the Minister for Local Government and Public Health, who last week introduced in the Dáil a Bill for the purpose of establishing such a hospital. It is proposed that the board of the hospital shall consist of 20 persons, of whom 7 shall be elected by the corporation of the city of Dublin, 3 by the Dublin board of public health, 7 by the existing trustees of Cork-street Fever Hospital (and their successors, provision being

made for a continuing electorate), and 3 to be appointed by the Minister. It shall be the duty of the hospital to receive, as far as accommodation permits, any patients suffering from infectious diseases sent on the order of the medical officers of health for the city and for the county of Dublin, their assistants, or any dispensary medical officer in the city or county of Dublin. Provision is made that the corporation of Dublin and the board of health shall make payments to the hospital board in respect of city and county patients respectively. Moreover, the corporation and the board of health shall make good any deficiencies in the establishment account of the hospital from time to time, their

contributions being in proportion to the respective valuations of the city and the county of Dublin. The hospital board, when constituted, is, with all convenient speed, to prepare and submit to the Minister a scheme for the erection and establishment of a new fever hospital in or near Dublin, setting out the proposed site, the plans and specifications, and the estimated cost. Approval of the scheme lies with the Minister who also reserves the right to modify the scheme subsequent to approval. It is understood that the cost of building and equipping the hospital will be met by a grant by the Minister under Section 25 of the Public Hospitals Act, 1933, from the Sweepstake Funds.

PUBLIC HEALTH

THE SPECIAL AREAS

THE report of the Commissioner for the Special Areas¹ deals primarily with economic conditions but merits consideration from its reference to certain aspects of public health.

At the time of the crisis in the cotton trade in Lancashire during the American Civil War public money was found for and employment provided in schemes of sanitary improvement under a special Act—the Public Works (Manufacturing Districts) Act, 1863. To such works many of the Lancashire towns owe a definite impetus towards the amelioration of the appalling sanitary environment which then prevailed. It is of interest to note the repetition of this experience during the present distress, and that the Commissioner has under his powers approved 152 grants to local authorities for works of public utility totalling a sum of £1,870,872. Grants are mostly in respect of sewerage and water schemes but have also been made to maternity and child welfare centres, and as an illustration of recent trend it is significant to remark the emergence of hospital grants—e.g., £240,000 to Durham county council and £250,000 to Glamorgan county council towards the provision of new general hospitals. The assistance thus rendered is timely in view of the fact that the authorities in the special areas are confronted with the difficulty that while schemes for amelioration of public services may be urgent, the pressure of unemployment has both reduced the rateable value and increased demands on the authority, as by the much enlarged scope of public assistance; thus in County Durham in 1934 (estimated population 914,500) a penny rate produced £12,092, in Middlesex (estimated population 1,810,200) the produce was £67,788.

Food for thought is provided by the observations of the Commissioner on the outlook for the adolescent population: "probably the most serious problem of the Special Areas is that presented by unemployment among young men between 18 and 21." Stress is laid on the social aspect of the passing into manhood of youths debarred from useful occupation, living in an atmosphere of unemployment, and accustomed from early years to maintenance by the State. The population of this age-group is given as 11,000, of whom 7000 have been unemployed for more than three months, so that during the recent black years in these areas a multitude has passed forward handicapped by this depressing passage from youth to manhood. The Commissioner shows concern, however, not only with this moral, social, and psychological reaction but also with the physical

condition of this section of the community. He states "the percentage of rejections on medical grounds for juvenile transfer centres and for the men's instructional centres is alarmingly high." Reference to this question is to be found in the recent annual report on "The Health of the School Child," and in the report by the Ministry of Health on conditions in Sunderland and the adjacent areas which stated "the condition of adolescent youths especially those aged 14 and 15 years is the least satisfactory feature of our findings." Anyone acquainted with the special areas must be seriously concerned by the problem of the unemployed adolescent.

It is well that the Commissioner can report some encouraging features, and it is to be hoped that the return of these areas to brighter conditions may not be indefinitely delayed. Limbs from which the blood-supply is cut off cannot but react on the body corporate.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED FEB. 15TH, 1936

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2173; diphtheria, 1203; enteric fever, 16; acute pneumönia (primary or influenzal), 1308; puerperal fever, 34; puerperal pyrexia, 99; cerebro-spinal fever, 22; acute poliomyelitis, 2; acute polio-encephalitis, 1; encephalitis lethargica, 4; continued fever, 1 (Rugby R.D.); dysentery, 42; ophthalmia neonatorum, 79. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Feb. 21st was 4617, which included: Scarlet fever, 987; diphtheria, 1094; measles, 1194; whooping-cough, 693; puerperal fever, 22 mothers (plus 15 babies); encephalitis lethargica, 281; poliomyelitis, 3. At St. Margaret's Hospital there were 22 babies (plus 11 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox, 1 (1) from enteric fever, 58 (8) from measles, 5 (1) from scarlet fever, 41 (13) from whooping-cough, 48 (7) from diphtheria, 47 (8) from diarrhoea and enteritis under two years, and 97 (12) from influenza. The figures in parentheses are those for London itself.

The mortality from influenza remains much the same, the total deaths for the last 11 weeks (working backwards) being 97, 85, 98, 104, 89, 110, 110, 80, 67, 62, 45. The deaths this week are scattered over 52 great towns, Birmingham reporting 6, Portsmouth and Salford each 4, Willesden, Oxford, Bradford, Liverpool, Manchester, Rochdale, and Wallasey each 3; no other great town more than 2. Liverpool and Manchester each had 10 deaths from measles, Middlesbrough 4, Croydon, Salford, Sheffield, Warrington, and Bristol each 3. Whooping-cough caused 4 deaths at Birmingham, 3 each at Manchester and Salford. Deaths from diphtheria were reported from 27 great towns: 4 from Liverpool, 3 each from Hull, West Hartlepool, and Plymouth.

The number of stillbirths notified during the week was 253 (corresponding to a rate of 40 per 1000 total births), including 38 in London.

¹ Second Report of the Commissioner for the Special Areas (England and Wales), 1936. Cmd. 5090. London: H.M. Stationery Office. 2s.

CORRESPONDENCE

ARTIFICIAL RESPIRATION FOR THREE AND A HALF YEARS

To the Editor of THE LANCET

SIR,—I described an unusual case of prolonged artificial respiration in your issue of April 14th, 1934, and I have now to report that the patient, a man who suffered from progressive muscular atrophy, died a few days ago at the age of 66. It may be recalled that respiratory paralysis began in 1932, and was at first intermittent, but continuous artificial respiration became necessary from June, 1932, until his death. An unorthodox manual method was in use for many months before Sir William Bragg introduced a very successful device, using simple apparatus and the experimental method. Eventually a machine worked by the water-supply was specially designed and made by Mr. R. W. Paul. The first instrument was installed in October, 1933. An improved model was substituted a month or so later, and this was in use thereafter. One slight alteration in design was made in October, 1934, in order to improve the lubrication, but no fundamental change or repair became necessary, in spite of the continuous wear caused by the 700 gallons of water which each day passed through it. Fortunately there was no shortage of water in the district during the last two dry summers. On one occasion the water-supply was cut off without notice, on account of repairs to the main; and once the water-pipes froze. The original manual method was used in both emergencies, and the patient was never left alone for fear of such accidents. An alarm note, resembling that of a bird, could be uttered by the patient with tongue and teeth without breath, and it was arranged that this should be a danger-signal to be used if the machine stopped working and the attendant did not notice.

The medical history after 1934 was almost as eventless as the scientific. No new symptoms arose until near the end, and the slight difficulty in swallowing became less. Dr. W. T. Mills, who was in charge of the case, and to whom I am indebted for the clinical details, treated occasional difficulty due to collections of mucus in the respiratory passages with atropine, and two respiratory infections with injections of "pneumococcus immunogen combined." Great care was taken with the skin, and no bedsores developed, in spite of the fact that the patient was moved very little, because there was only one position in which he was really comfortable. During the daily washing, which took 1½–2 hours, the manual method of artificial respiration was employed, which gave the chest a relief from the wearing of the belt. The patient remained mentally active to the last, and both apparatus and illness ran so smooth a course that the chief feature of the case became an unforgettable revelation of how rich life could remain with an incapacitated body when the spirit was unconquered. During the last few days of the patient's life he had a gastro-intestinal disorder, together with difficulty in opening his mouth and in swallowing. He died while he was asleep.

The artificial respiration apparatus has become known as the Bragg-Paul Pulsator, and an electrically worked model has been described by Mr. Paul in the *Proceedings* of the Royal Society of Medicine (1935, xxviii., 436). Its manufacture has been taken up by a firm of safety engineers, Messrs. Siebe, Gorman and Co., of 187, Westminster Bridge-road, London S.W. This firm keeps one instrument which

is available for hire in emergencies. It can be obtained by telephoning Waterloo 6071 by day or night, and arranging for transport. The machine has been used successfully for cases of temporary respiratory paralysis complicating diphtheria, and anterior poliomyelitis. It has been installed in the first-aid room of a large mining concern for cases of gas poisoning. A miniature model is on trial for selected cases of asphyxia neonatorum.

I am, Sir, yours faithfully,

PHYLLIS M. TOOKEY KERRIDGE.

University College, Gower-street, W.C., Feb. 24th.

THE EMBLEY MEMORIAL LECTURE

To the Editor of THE LANCET

SIR,—You were good enough to refer in your issue of Feb. 22nd (p. 438) to the Embley memorial lecture which I delivered in Melbourne in September last, and to note that it has been published in the *Medical Journal of Australia*. I was gratified at the publication of the lecture, but it was accompanied by an editorial expression of opinion against which I have felt it necessary to protest. I would ask if that protest may appear in THE LANCET as it is quite possible that those readers who see the *Medical Journal of Australia* may read the denunciatory leading article there but not the lecture itself. The leading article closes with the following passage:—

"The results of the modern type of cerebral operation speak for themselves. If in the future surgeons are able to evolve newer methods of securing the necessary gentle handling of tissues, a sepsis, hæmostasis, and so forth, together with speed, Dr. Mennell's wish will be gratified. This does not at present seem possible. Dr. Mennell comes from London as an anæsthetist of world-wide reputation. His views on anæsthetics and their administration will be listened to with respect. His utterances on cerebral surgery are to be deplored in a country where neuro-surgeons are trying to bring their art to the high level attained in other parts of the world. It is to be hoped that no serious attention will be paid to them."

In support of this contemptuous view the article says:—

"It can be dogmatically stated that the present so-called slow technique has achieved infinitely better results than were obtained by the older methods. To refuse to follow modern methods with a slavish attention to minute detail is to jeopardise the life of the patient. It has been computed that at present the death-rate for complete removal of cerebral tumours in Australia, even with the use of modern methods, is somewhere in the region of 80 per cent. Cushing has for certain types of tumour brought his mortality down to as low as 7 per cent. What the death-rate with the old rapid methods was may be left to the imagination. . . . When the operation was performed rapidly, it was the exception rather than the rule for the patient to recover."

Since writing the above I have seen the leading article in THE LANCET of Feb. 22nd entitled *The Gentle Surgeon*, and it appears to me apposite to the remarks made in my Embley lecture and for which I am criticised. Nobody can dispute what is said in your leading article about the surgery in the early part of this century, or that the advance in anæsthesia and the better understanding of shock have enabled surgeons to do without the extreme slashing speed formerly necessary. But surely the pendulum has swung too far, more surgeons relying on the better anæsthesia for a too great deliberateness in their methods. Gentleness and care combined with unflurried speed are the essentials of good surgery.

In reply to the *Medical Journal of Australia* I have made the following protest which they will have received by now, and which I shall be much obliged if you will quote.

I am, Sir, yours faithfully,

Harley-street, W., Feb. 21st.

Z. MENNELL.

COPY OF LETTER SENT TO THE EDITOR OF THE
Medical Journal of Australia

Feb. 4th, 1936

SIR,—Holding the views you have so clearly and forcibly expressed in your leader of Dec. 14th, I feel I must first thank you for your courtesy in giving a verbatim report of the Embley lecture I delivered in Melbourne in September, 1935.

The slides, through an error, have been referred to incorrectly, but notwithstanding the well-known difficulty of reproducing coloured slides, they remain clear enough for anyone reading the paper to realise the mistake.

Your leader is another matter; I wrote the lecture with extreme care, and apart from my personal views I am entitled without giving offence to give reasons why a change in anaesthesia has become necessary in certain cases. No one can be more alive than I am to the fact that there are two schools of thought in intracranial surgery, but I am convinced that speed and gentleness are compatible.

You speak first of all of thoracic surgery. Surely it must be admitted that in this work speed is essential whether the operation is done under a local or general anaesthetic. The most recent lobectomy to which I gave an anaesthetic was done in twenty minutes under a very light chloroform anaesthesia, and the excellent result in this and in other cases in which I have been concerned makes me think that in the future the mortality of this very serious procedure may be lowered by a combination of speed and simple anaesthesia.

I can well understand that when you admit an Australian operative mortality of 80 per cent. for the removal of cerebral tumours some change is desirable. Such a mortality is far higher than anything I have met during the thirty-two years I have been giving anaesthetics for such cases. It is because I believe certain neurological surgeons have evolved "the necessary gentle handling of the tissues, aseptis, haemostasis, and so forth together with speed" that "I cannot understand why it is necessary to be so slow" in making a bone flap, &c. Giving anaesthetics to such cases almost daily, and seeing them afterwards, makes it possible to form the opinion which I felt at liberty to express. I do so more readily as I have had the opportunity of seeing cerebral surgery in the new world and on the continent as well as in England. Are Dandy and Adson, whose skill is recognised throughout the world, slow operators? You will naturally reply to this more "vague and general statements." I have figures of course that could be made to prove anything, as they would include many desperate cases and a great variety of tumours.

Here are the figures of four sets of cases.

1. Pituitary tumours operated on by the intracranial route in one year. Twenty-one consecutive cases in 1928 without any untoward symptoms or death. Shortest time forty minutes; longest seventy-five minutes. Neither the late Sir Percy Sargent, who was the surgeon, nor I could claim this a constant figure; but the facts are as stated. Anaesthetic: intratracheal ether with pressure.

2. Gliomata unselected and unclassified. The late Sir Percy Sargent's records, analysed by Mr. Harvey Jackson, who has given me the following data.

Two hundred and sixty successive cerebral gliomata—mortality 12.7 per cent. within forty-eight hours.

This is case mortality and not operative mortality, which would be considerably lower.

3. Hedonal anaesthesia. A hundred and twelve cerebral tumours removed reported in the *Transactions of the Royal Society of Medicine, Section of Anaesthetics, 1922*. No death from anaesthetic within twenty-four hours.

4. To illustrate work with which I am concerned in London (if one may venture to cite English experiences

in Sydney) I quote one of my last cases (surgeon, Mr. Julian Taylor).

H. L. 38. Operation Jan. 31st, 1936, for left parietal endothelioma. Anaesthetic started 11.20 A.M. Large bone flap extending across midline. Tumour, weighing 82 grammes, removed. Part of the bone flap taken out which was invaded by the tumour, and then fixed in position. Wound closed and patient in bed 1 P.M. Condition good. Anaesthetic: Atropine, intratracheal N₂O and O₂, ether.

Feb. 2nd: Patient comfortable. Sitting up in bed eating food.

To-day, Feb. 4th: Pulse 76, temperature 97.6°. Patient sitting up apparently without abnormal symptoms.

The use of local anaesthesia and basal narcotics may be the most usual practice in Australia, it is not here. A small quantity of ether added to continuous stream of gas-and-oxygen is believed to be best after an extensive trial of other methods. I hasten to add pulmonary complications do not occur.

My first impression on reading your leader was surprise, but then it occurred to me how my old friend, Embley, would have risen to the occasion, and I only wish I had his facile pen and power of expression at my command.

I am, Sir, yours faithfully,

Z. MENNELL.

"MORBUS BRITANNICUS"

To the Editor of THE LANCET

SIR,—Dr. Copeland reproaches me with attaching a new label to an old disease. It should be evident from my note that it was not at all my purpose to make new confusing labels to put in text-books, which are most of them surely too big already. I only wanted to call attention to the fact that at the Faroe Islands we observed so many cases of fireman's cramp, among British fishermen only, that we gave the illness a simple geographical name. I emphasised that it is a form of fireman's cramp, and referred to Haldane's researches into miner's cramp, which Macintyre evidently also considers important in the pathogenesis of fireman's cramp. That it is an acute vagotonia I for my part am inclined to doubt, first because similar symptoms are observed in ulcer-stenosis as gastric tetany, secondly because the amount of chlorine in the urine is plainly reduced. Examination of the blood should decide that. The observation that atropine relieves the symptoms in some cases I can confirm, but it does not rule out deficiency of salt or chlorine ions as causing the illness. The fact that a supply of chlorine ions intravenously or rectally can cure the illness at a stroke appears to me much more significant.

I am, Sir, yours faithfully,

Klaksvig, Feroe, Feb. 14th.

SV. E. KOFOED.

DUTIES AND RESPONSIBILITIES OF A SHIP'S SURGEON

To the Editor of THE LANCET

SIR,—After fifteen years ashore in general practice I entered on the duties and great responsibilities of a ship's surgeon on a big liner plying between London and Japan. In common with a large number of my brethren ashore I thought that it would be a light task. I found, of course, that it is a specialised job which needs a considerable time to learn the way of. That by the way. I am hoping that this letter may draw the attention of the profession to those cases which are not suitable to be sent for a "sea voyage." I made the mistakes myself in practice and it is only since I have been at sea that I have realised what gross mistakes they are.

Let me say that the resources of the modern liner are such, nowadays, that almost any treatment can be carried out on board provided that due notice is given of anything special that will be needed. Again,

it is often necessary for a given individual to be conveyed from one place to another irrespective of what he is suffering from. This can be easily arranged, but the surgeon should be notified in good time and certain conditions must be agreed to. It is not with such cases that I am dealing. It is with those patients for whom the doctor in charge prescribes a "sea voyage." I often think that this prescription is sometimes given to get them out of sight and out of mind. The particular types of cases I have in mind are:—

1. *Pulmonary cases with a cough.*—From a physical point of view the rapid changes of temperature on a voyage such as this, together with the extreme humidity experienced after Port Said, are reasons enough to contra-indicate recommending such a case to take a sea trip. But think of the psychological aspect. Everything that happens on board is known all round the ship within a few hours; there are no secrets. What patient can refrain from discussing symptoms, especially a consumptive. The fact becomes known and the patient is ostracised, very kindly, but nevertheless ostracised. I have not dealt with the obvious danger to other passengers in such an enclosed space.

2. *Neurasthenia.*—This is the favourite type to send to sea and the most unsuitable. The phrase includes all types, the most usual of which are (a) melancholic; (b) dipsomaniac; (c) the unstable type.

(a) *Melancholic.*—The opportunities for suicide on board ship must be seen to be believed. There is to start with a long ship's side with sea all around into which the would-be suicide can plunge. He has a cabin to himself in which he can lock himself and do what he pleases. By nature morose he establishes very few contacts with his fellow passengers and goes from bad to worse. The first thing the surgeon hears is that he has gone overboard. Apart from the fact that this costs the company a good deal of money, in stopping the ship and picking him up, it is good marks neither to the doctor who sent him on the voyage for his health nor to the ship's surgeon who knew nothing about him.

(b) *The dipsomaniac.*—This is an obvious case which should not be sent to sea. The opportunities for drinking on board are unlimited. The "chit" system makes it very difficult to check and control the amount of alcohol any given man consumes. And he can always get a drink from a friend.

(c) *The unstable type.*—Until I came to sea I did not know that so many very odd people existed. I have had to deal with borderline cases and oddities of all kinds, and they have all given rise to a great deal of anxiety, chiefly from the danger and opportunity of suicide but also owing to the resentment of other passengers. One lady of uncertain age caused alarm to women passengers by claiming relationship with a different Royal family each day. Another girl was an aggressive nymphomaniac. A man had the habit of wandering around the ship at night waking up complete strangers and demanding all manner of things from cigarettes to typewriters. This last, I found later, a man of good family, had been released from a mental nursing-home two days before the ship sailed and put on board by himself and without notification to anyone.

3. *The venereal case.*—It will hardly be believed that on three occasions I have found, by chance, cases of acute gonorrhœa, travelling in cabins with other passengers, who have been instructed by their doctors to douche themselves in one of the ship's baths. Apart from the danger to his cabin mate,

the fact that the bath will be used by eight or ten other passengers makes such instructions almost criminal.

There are other unsuitable people who are sent to sea for their health, but the above are the most common.

In conclusion let me say that any ship's surgeon, at any rate in the bigger lines, will be always ready to coöperate in any way he can to make the path of a patient easy and as pleasant as possible. If the doctor in charge of the intended passenger will take the surgeon into his confidence, let him have what notes are necessary for the proper understanding of the case and suggestions for the continuance of treatment, much more satisfactory results will ensue.—I am, Sir, yours faithfully,

Feb. 24th.

SHIP'S SURGEON.

A DANGEROUS REMEDY

To the Editor of THE LANCET

SIR,—The *Manchester Guardian* of Feb. 21st reports the case of a 14-year-old boy who was forced by his father to eat a cigarette as a cure for smoking. The father's action appears to have received the approval of the court.

You have previously published notes of certain cases of nicotine poisoning in which patients of mine have been seriously affected by absorption of pure nicotine through the skin. Such experience as I have in this type of poisoning leads me to send you an emphatic protest regarding the treatment of cases of juvenile smoking by the method related above. If this method should be adopted by other parents I think there will undoubtedly be fatalities and it is a pity that approval should have been given to what is obviously a most mistaken course.

When a cigarette is smoked the nicotine is oxidised, but when it is eaten or when a decoction of tobacco is applied to the body there is grave risk of serious poisoning, and I trust that the attention of the authorities may be drawn to what is obviously a little realised but nevertheless serious risk.

I am, Sir, yours faithfully,

Nottingham, Feb. 24th.

L. P. LOCKHART.

THE OXYGEN TENT SERVICE

To the Editor of THE LANCET

SIR,—An oxygen tent of the Guy's Hospital pattern has been sent by the British Red Cross Society to each teaching hospital in London, so that a wide experience of this method of treatment may be gained. In this connexion we have been asked by the society to act as a small medical advisory committee.

We desire to draw the attention of the profession to the facilities afforded by the Oxygen Tent Service, which is at present under our control. For over two years arrangements have been made to send a tent to any part of the country and even abroad at the request of any medical man. A physician, not medically qualified, accompanies the tent. The furthest distance a tent has travelled is to Gibraltar at the request of a well-known physician. Applications should be made to the secretary, Mr. T. W. Adams, A.Inst.P., and the address (for the present) is 25, Upper Wimpole-street, W. 1 (Tel.: Welbeck 1627).

We are, Sir, yours faithfully,

REGINALD HILTON, WILFRED J. PEARSON,
E. P. POULTON.

London, W., Feb. 24th.

WHAT IS SCARLET FEVER FOR THE CLINICIAN?

To the Editor of THE LANCET

SIR,—In the admirable paper on this subject published in your last issue, Dr. F. G. Hobson says much that will be accepted by those who have had experience in throat infections and in scarlet fever—if for a little longer we may be allowed to use that term. It is refreshing to have a challenging article such as this, for the time is certainly ripe to take stock of and to readjust our attitude to streptococcal infection in general. Whether much will be gained by abandoning the term scarlet fever is, however, debatable. Even though it is the name only of a syndrome, and there are, as in all infectious syndromes, borderline and atypical cases, the term is useful. Scarlet fever is a convenient description of a type of streptococcal infection in a non-immune. That the field of streptococcal infection is wider than has been appreciated in the past is no reason why a well-mapped corner of it should lose its notice board.

A fundamental point on which much more evidence is required is the statement that the liability to serious complications appears to be slightly greater in cases without an erythema, or in other words, that erythema is a favourable sign. This surely is exceedingly doubtful. Only an exhaustive clinical study of non-erythematous streptococcal tonsillitis for the periods and under the conditions in which we observe scarlet fever could settle this. After all, the erythema is an indication of non-immunity. It is suggested that a non-immune is better off than a partial immune. If this be so, I do my staff a disservice when I immunise the Dick-positive reactors among them. Given the same streptococcus, is it safer to have scarlet fever than tonsillitis? I doubt it. And if erythema is a favourable sign, why should we give serum, one of the demonstrable effects of which, if given early and intravenously, is to abolish the rash.

If we ask "what is scarlet fever for the clinician" we must also ask "what is streptococcal infection for the bacteriologist." For some little time we have been plating the throat swabs of scarlet fever admissions on blood agar. The cases are typical of the prevailing mild scarlet fever of the district. The striking feature of these plates is the mixed streptococcal infection present. β -haemolytic streptococcal colonies may be scanty, fairly numerous, or numerous, but the other organisms which usually outnumber them are α -haemolytic and non-haemolytic streptococci with a few staphylococci. In one case no β colonies were found, but repeat swabs were not obtained. The picture differs according to the blood plates used, the same swab sown on to (1) horse blood agar, (2) human blood (individual A) agar, and (3) human blood (individual B) agar showed: (1) good growth but no haemolytic streptococcal colonies; (2) good growth with one or two doubtful haemolytic colonies; (3) good growth with numerous typical β -haemolytic colonies. I mention these points to illustrate the complexity of working out throat infections and the need for a standard technique if, as has been suggested, swabs are to be used as a public health measure.

"Scarlet fever" or "streptococcal fever with erythema." Such would appear to be Dr. Hobson's choice. After all a disease is not a thing. There are no infective diseases, there are only organisms infecting hosts and producing no symptoms or varying symptoms. Dr. Hobson may call meningococcal fever a disease, but I might call it a rare complication

following infection of the nasopharynx by the meningococcus. What's in a name? Only a short description of a clinical syndrome and as such it is useful. Scarlet fever is a useful term.

Dr. Hobson's refreshing paper might well have been entitled What can Public Health do for Streptococcal Infection. It is a plea for something more than the abolition of a name. It calls for further study of these infections and a reconsideration of our policy towards them. We want our fever hospitals to do the most needed and most useful work possible and if there are better indications for the admission of streptococcal fever than the presence of a rash, let us use them. But what these indications are and how they can best be applied are wide problems on which much thought will be needed. Should all cases of tonsillitis and other streptococcal infections be notified? I can hear both general practitioners and medical officers of health, with an unusual unanimity, say Heaven forbid. This and many other questions are involved and Dr. Hobson's paper should hasten their consideration.

I am, Sir, yours faithfully,

H. MASON LEETE.

Hull City Hospital, Cottingham, Yorks, Feb. 24th.

To the Editor of THE LANCET

SIR,—The question which forms the title of Dr. Hobson's excellent article is one which has been puzzling many practitioners for a long time. A paper discussing some of the points he raises was contributed by one of us (J. C. S.) to the *Medical Officer* of Jan. 18th last, and a complementary paper by the others (F. E. C. and J. M. W.) is in course of preparation. Meanwhile it may be appropriate to mention one or two of the observations we made during a milk-borne epidemic of scarlet fever, and the steps taken to control it.

In the first place, the tendency of the early cases to show no rash bore out Dr. Hobson's experience. Secondly, he may be interested to know that the Schultz-Charlton reaction, performed as a routine in all cases admitted to the isolation hospital (the majority of which were type 2), gave a positive result regardless of the type to which they belonged; whilst one or two definite type 2 cases gave a definite negative result. Accordingly we regarded the test of no value and discarded it.

In view of the number of cases of streptococcal tonsillitis there had been in the area for some years, and of experience with the epidemic, the following administrative measures were adopted. (1) Notice has been circulated to medical practitioners that the function of the isolation hospital is to deal with all cases which by reason of their infectivity cannot be admitted to a general hospital, but that admission is limited, as far as possible, to patients in the above category who are sufficiently ill to require hospital treatment or are so placed as to be an especial danger to public health. (2) Scarlatinal antitoxin and polyvalent antistreptococcal serum are available free of charge for administration at the patient's own homes by their medical attendant in exactly the same way as diphtheria antitoxin. (3) The question whether a case is notifiable as scarlet fever is for the practitioner to determine; but during the epidemic practitioners were informed that notifications of streptococcal sore-throats, with or without a rash, would be accepted as scarlet fever; and an increasing number of such cases were notified, thereby helping to control the outbreak. (4) The throats of all patients were swabbed on admission to the isolation hospital and also at their own homes by their own

doctors. The swabs were examined for hæmolytic streptococci, and if positive were typed. This was of value in tracing the source of infection and in preventing cross-infection on the isolation hospital.

We note with interest Dr. Hobson's suggestion that the typing of hæmolytic streptococci might be of value clinically. So far as workers have shown up to the present, typing appears to be more applicable to the public health side of medicine—in tracing the source of infection, and in controlling epidemics and preventing cross-infection—than in clinical practice. Gunn, Griffith, and other observers have hitherto failed to trace a definite clinical picture associated with specific types, but it might appear that certain types under certain conditions are more virulent and give rise to more complications, whilst certain others seem to be relatively mild.

We are, Sir, yours faithfully,

J. C. SLEIGH, J. L. MILLER WOOD,
Chelmsford, Feb. 25th. F. E. CAMPS.

TREATMENT OF PSYCHOSES BY PROLONGED NARCOSIS

To the Editor of THE LANCET

SIR,—In his interesting paper in your last issue Dr. D. N. Parfitt records that he used Somnifaine for prolonged narcosis 60 times with 3 fatalities. As this high mortality-rate (5 per cent.) might well dissuade others from carrying out this valuable form of treatment, I should like to point out that it is not in accord with our experience at Cardiff City Mental Hospital, where prolonged narcosis has been carried out in 240 psychotics and neurotics. When somnifaine alone was used we had 2 deaths in 86 treatments (2.3 per cent.); but since glucose and insulin have been used to combat toxic symptoms 154 cases have been treated without a single fatality. A future publication will deal with possible causes of this discrepancy in mortality-rates, and here I will merely state that at Cardiff, with careful nursing in a darkened single room, it is rarely found necessary to give more than 4 c.c.m. of somnifaine in the 24 hours.—I am, Sir, yours faithfully,

P. K. MCCOWAN,
Medical Superintendent, Cardiff City
Mental Hospital.

Feb. 24th.

AN ADDRESS IN HARLEY STREET

To the Editor of THE LANCET

SIR,—A belief common among laymen is that doctors may not advertise; whether the ban is imposed by law or the rules of good form, whether it is *de jure* or *de facto*, does not interest the layman, nor does it matter for the purpose of this letter. The question is: what is "advertising" in the meaning of the ban on professional men? We know that in commercial practice the object of advertising in the broad sense is to draw attention to specific goods; to create the impression in the minds of potential purchasers of the genus of goods that there is none so choice as the species advertised. We know, too, that to all intents and purposes there is no restraint on commercial publicity, and that in this respect trade advertisers enjoy a measure of liberty which is almost immeasurable—such a measure of liberty as is probably without parallel in human things. It may be for good, it may be for bad, but on balance it is probably for good.

Advertising in its popular meaning brings to mind posters on the boardings, pamphlets distributed from house to house, and especially—the best means of all of bringing the commodities of life to the

notice of the public—the newspaper press. All these methods are denied to the professional man, and with the consequence that if he desires to draw attention to himself he must have resort to more subtle means. In the case of the doctor there are in common use the red lamp, the blue lamp, and the brass plate—it may be a personal subtlety to have the plate larger and more brightly polished than his neighbours' plates, and, in some districts, clean curtains point out the doctor's house. The lamps and plate are without reproach in the view of laymen and even commendable since there are times when a doctor is wanted in a hurry.

There is another means of advertising open to the medical man which is not so subtle as he seems to believe; in fact it is becoming so obvious as to be damaging to a section of the profession and I doubt whether it is any longer misleading to the public. I say this as a layman and I may be wrong, but it seems to me, and the opinion is gaining ground, that the fame of "Harley Street"—and by "Harley Street" I mean not merely that thoroughfare but also its environs—is being exploited for advertising purposes. There may be a danger to the profession and to the public in the use of an address merely for advertising purposes. It is even said that not a few charlatans are housed in the district and that the place is as overcrowded—an exaggeration of course—as some of the slums in the East End where several families live in the same room. It ought to be known to the public that "Harley Street" is not a degree but an address.

I am, Sir, yours faithfully,

Whitehall-place, S.W., Feb. 15th. F. C. GOODALL.

THE TREATMENT OF VAGINAL DISCHARGE

To the Editor of THE LANCET

SIR,—The annotation, A Remedy for Vaginal Infections, in your issue of Feb. 15th caused me some astonishment, since it appears to be in the nature of a good advertisement for a proprietary article Devegan. The whole question of vaginal discharge being such a very complicated and difficult one, it seems to me a pity to publish an article of this nature which will make many doctors think that at last a cure for vaginal discharge has been found.

I think you will agree that vaginal discharge is most often due to a chronic endocervicitis, and that this will not be affected by any treatment applied to the vagina. As it is most important to make a complete and thorough gynaecological examination before commencing treatment for vaginal discharge, I feel that it is unwise to recommend a purely vaginal treatment. My own experience of this condition is that a vaginal discharge caused by a localised vaginal infection is very rare; that the presence of the *Trichomonas vaginalis* is very rare; and that, at present, the case for the value of devegan is far from being proved.

I am, Sir, yours faithfully,

Bournemouth, Feb. 19th. S. GORDON LUKER.

. We are glad to have Mr. Luker's views and would welcome other expressions of opinion on the treatment of vaginal discharge. We do not agree with him, however, that it is improper to comment on proprietary preparations of known composition. Many of the most important remedies now in use (from salvarsan and aspirin downwards) were introduced under protected names, and though monopolies are in many ways undesirable they are a recognised condition of modern manufacture, and may be a valuable stimulus to chemotherapeutic research.—ED. L.

RUSSELL'S VIPER VENOM*To the Editor of THE LANCET*

SIR,—Our attention has been drawn to a disturbing statement, reported in the daily press, and attributed to Dr. Peck, of New York, to the effect that the use of snake venom as a hæmostatic has been practically abandoned in the United States on account of the severe reactions produced. Since Dr. Peck is well known for his treatment of hæmorrhagic states by the injection of moccasin venom, which frequently produces local reactions (*THE LANCET*, 1935, i., 997), we believe that the statement refers to this procedure. Moreover, we are not aware that Russell's viper venom has received a trial in America. In the many cases of hæmorrhage treated at St. Bartholomew's Hospital and elsewhere, by the local application of Russell's viper venom, we have not observed any

reaction or local effect other than coagulation of the issuing blood.

In view of the apparent confusion, it may be useful to summarise the venoms that have been employed therapeutically. Cobra venom has been used as an analgesic, particularly in cancer; this and puff adder venom in the treatment of epilepsy; moccasin venom has found an application in certain hæmorrhagic conditions and skin diseases. All these are given by injection. Dilute solutions of Russell's viper venom are only employed as hæmostatic applications direct to bleeding surfaces. This venom is, in our opinion, the most effective local hæmostatic available.—We are, Sir, yours faithfully,

R. G. MACFARLANE,
BURGESS BARNETT.

Pathological Department, St. Bartholomew's
Hospital, E.C., Feb. 25th.

OBITUARY**PRIESTLEY LEECH, M.D. Lond., F.R.C.S. Eng.**

CONSULTING SURGEON, ROYAL HALIFAX INFIRMARY

Dr. Priestley Leech, who died on Feb. 7th, had been in indifferent health for some months but had continued in harness until a few weeks before his death. A native of Halifax he was educated at Owens College, Manchester, where he took honours in several scientific subjects. He qualified as M.R.C.S. Eng. in 1885 and graduated M.B., B.S. Lond. in 1888, obtaining the F.R.C.S. Eng. in the following year. He was for a time house surgeon at the Warrington Infirmary but returned to commence general practice in Halifax, and in 1890 was appointed honorary medical officer to the Royal Halifax Infirmary, an institution which he served until resignation in 1919 when he was made honorary consulting medical officer. He was also the medical officer in charge of the venereal diseases clinic at the Infirmary.

A colleague "J. F. H.," writes: "Dr. Priestley Leech carried on a large general as well as a surgical practice, and for a long period he was the best known consultant over a wide area outside his own town. A voracious reader and a keen observer, he acquired a large practical experience so that his judgment was always sound and valued by his colleagues, and his patients had every reason to be grateful for his skilful and capable surgery. His reputation was more than local. For many years he contributed the article on General Surgery in the *Medical Annual*. He was an expert linguist and abstracted the items from the original. In spite of his very busy life he found time to undertake much work for the profession. He had been chairman of the local medical society, the Halifax division of the B.M.A., and of the Leeds and West Riding Medico-Chirurgical Society. During the war he did much valuable surgical work amongst the soldiers in his own hospital and at St. Luke's hospital, Halifax. When his work would allow him a few hours of relaxation he indulged in his favourite sport of fishing, of which he was an enthusiast. His reminiscences of fishing men and fishing dinners were always entertaining."

Dr. Leech was in his 74th year when he died, and leaves a widow and one son. He celebrated his golden wedding last year.

ARTHUR JAMES ARCH, M.R.C.S. Eng.

Dr. A. J. Arch, who died on Feb. 14th aged 58, was a well-known Coventry practitioner, holding a

large number of public appointments. He was born in Coventry, the son of Mr. James Arch, who was for a long period clerk to the Coventry Board of Guardians, and received his medical education at Birmingham, qualifying as L.R.C.P. Lond., M.R.C.S. Eng. in 1904. He was one of the best known general practitioners in Birmingham, having an extensive general circle of patients, while he was closely identified with National Health Insurance administration, being a member of the Coventry Insurance Committee for 14 years and for a considerable period vice-chairman of the Coventry Panel and Local Medical Committee. Dr. Arch was also public vaccinator when the duties of the Poor Law Guardians were taken over by the municipality, and until the time of his death was public vaccinator under the new authorities. He had been a considerable athlete in his younger days.

ALEXANDER WAUGH, M.B. Glasg.

The recent death at Prenton, Birkenhead, of Dr. Alexander Waugh, has removed a practitioner who for a considerable period occupied a prominent position in Skipton. He received his medical training in Edinburgh and Glasgow and graduated in medicine at the University of Glasgow in 1899. He now practised at Skipton where he had a large practice, being also medical officer to the infectious diseases hospital and poor-law officer to the Skipton sub-district. While at Skipton a serious small-pox epidemic occurred, and Waugh, who had already shown keenness in regard to prevention and suppression of infectious diseases, was so successful in the measures which he took that he was thanked by the urban council for his labours. He left Skipton in 1909, his residence there being terminated by a breakdown in health leading to a sea-voyage. On his return he entered practice in Birkenhead. He did much good work at home during the war, and on the cessation of hostilities held for a period a position under the Ministry of Pensions. He was also medical examiner to many insurance companies and gave medical advice to various shipping companies. Dr. Waugh had been in bad health for the last ten years and was 72 years of age at the time of his death.

ST. GEORGE'S-IN-THE-EAST HOSPITAL.—A new out-patient department at this hospital has been planned by the London County Council at a cost of £20,000. It will include two new receiving wards and an antenatal unit.

ENDEMIC YELLOW FEVER IN TOWN, VILLAGE, AND JUNGLE

THERE has been a revolution in the last decade in ideas of the prevalence and origin of yellow fever, especially in South America. In 1926 the disease was thought to be confined to the north-east corner of Brazil, and it was believed that with anti-mosquito measures it was rapidly disappearing and could soon be eliminated. It was considered a disease limited to the cities and maritime parts of the east coast and to some extent to the shores of the Amazon. The only infecting agent of importance was then thought to be the *Aedes (Stegomyia) aegypti* mosquito which was found only in the houses of an urban population. To-day, however, it is known that yellow fever is widespread throughout the two-thirds of the continent north of Paraguay and east of the Andes. The more intensive the investigations, the more cases are discovered in places remote from cities and maritime transport, in the jungles and plains of the interior, with sporadic outbreaks in isolated settlements where no means of contact can be found. It is now known that the disease can be transmitted by a large variety of mosquitoes and in the complete absence of the stegomyia. Hope of controlling the disease solely by anti-mosquito measures has been abandoned and a new means of prevention has had to be devised.

THE CAMPAIGN AGAINST THE DISEASE

Dr. F. L. SOPER, of the International Health Division of the Rockefeller Foundation, outlined this revolution in the history of yellow fever in an address given at the London School of Hygiene and Tropical Medicine on Feb. 24th. Warfare against the disease had, he said, been successfully waged in South America since 1914, and from 1920 to 1924 it had disappeared from the equatorial zone. In 1927 there was a period of 11 months without a single notified case in the continent. The next year, however, it reappeared in Rio de Janeiro after an absence of 20 years and again in north-east Brazil. In 1929 it had once more spread along the coast and up the Amazon valley. There were isolated outbreaks in Colombia and Venezuela with no known focus of infection or possible contact with other infected places. The year 1930 saw a campaign of intensive anti-mosquito measures throughout the country, not only in the cities but in small towns and villages. These methods were still inadequate and it was decided to hunt for the mosquito in unsuspected places and for the disease in unsuspected persons. The very valuable "viscerotomy service" was organised. Liver tissue, removed post mortem with the viscerotome from every person dying within ten days of the onset of any disease, was sent to the laboratory; it was found that a proportion of the specimens had the lesions of yellow fever. The mouse-protection test¹ was first used on a large scale in 1931, and it was then discovered that over an area of two-thirds of the whole continent every community had a varying proportion of acquired immunity, showing that no part of that area was free from the disease, in spite of the absence of *A. aegypti*. Even young children had this immunity and it was most evident in Indians remote from any

possible known source of infection. This discovery made some investigators sceptical of the value of the test.

During the next three years there were several isolated outbreaks, one among troops in Bolivia that were being acclimatised in preparation for the Chaco war, but their significance was not remarked, though they had taken all by surprise. In 1935 the investigators were startled by a large outbreak far beyond their expectations in an area hundreds of miles from any contagious focus, believed to be free from yellow fever and investigated only to complete the survey. The mouse-protection tests had given a proportion of positives of only 1.6 per cent., and yet, soon afterwards, evidence was found that there must have been thousands of cases of the disease spread over an area of more than 100,000 square miles. The disease did not come into the cities, of which there were several of a population of 30,000-40,000, but the outbreak still continues.

JUNGLE YELLOW FEVER

These events led to the discovery of a second type of the disease known as jungle yellow fever, to distinguish it from that due to the stegomyia. This was prevalent in the remote districts and was believed to be traceable to infected wild monkeys, though there were no *A. aegypti* for hundreds of miles. The diseases were, however, identical in all other respects, not only clinically but also in their response to cross-immunity and monkey transmission tests and in the pathological lesions produced. The disease, it was true, was at present sporadic but there was no reason why the cities might not become heavily infected from immigrants. The stegomyia type was confined to the houses, whereas the jungle fever was found only in those who lived in close proximity to uncut forest. In fact, in many parts it was known to the people as "fiancé's fever" for it infected young men who had left the community to prepare a home further afield. Graphs of the age-incidence were very illuminating in contrasting the two types of the disease. The stegomyial yellow fever in rural districts had its greatest incidence in the early years of life, whereas the jungle type occurred in the young adults group, that is to say, in those that worked in the field and away from their homes. In towns, stegomyial fever showed the early peak found in the rural districts, but also a second peak in early adults, similar to that of the jungle disease. This second curve was due to immigration from the country of non-immune people who quickly fell a prey to the *A. aegypti*. It was also notable that the disease was one that proved fatal to children, the greatest incidence being under 5 years and the next greatest between 5 and 9 years.

Dr. Soper showed a number of photographs of the type of settlement in which a large proportion or all of the people had an acquired immunity. The disease was never present where there was no adjacent uncut jungle, but even small areas of forest in open prairie country were virulent sources of infection. That the wild monkeys were responsible had been proved, for in some investigations 20 per cent. of the monkeys killed in the jungle were found to be infected with yellow fever. This source of infection would never be eradicated but he believed that the new preventive measures against the stegomyia mosquito in the towns would prevent epidemics. It had been discovered that if the breeding-index—i.e., the proportion of houses in the town harbouring the mosquito—was reduced to

¹ Yellow fever virus, fixed for mice, is inoculated intraperitoneally into a mouse, together with the serum to be tested. A simultaneous injection of starch solution into the brain localises the virus and if the serum lacks protective power (a negative result) the animal dies of yellow fever encephalitis.

below 2 to 3 per cent. and maintained there, the probability of infection was remote. Every town had now a periodic examination at least every quarter. If *A. ægypti* was discovered, every house was searched for possible breeding-places, adult mosquitoes were captured, and exposed water was covered with petroleum. In this way even the large cities were able entirely to eliminate the mosquito for several weeks, before one was found, introduced from another place. The viscerotomy service was still continued in every district, and it was the duty of a responsible layman if necessary to provide the specimens. There was also a close coöperation between the health services of the different sea-ports, and information was exchanged which was of even greater importance than the incidence of the mosquito or disease in each individual city.

THE PROBLEM IN AFRICA

In the discussion that followed the address, reference was made to the spread of yellow fever in Africa. Dr. Soper did not believe that because certain areas such as the Sudan were at present free from infection there would be no epidemic in the future; on the contrary, the experience of South America had shown that after apparently

absolute freedom there might be widespread outbreaks. He felt sure that there was jungle yellow fever throughout a large area as far east as the Great Rift Valley; in fact in a recent journey there he himself had found cases of this type in Uganda. Kenya was free because of the nature of the country and its vegetation, but as far as he knew there was no eastern limit to possible infection in the Sudan. The spread of motor traffic would bring civilisation; that brings clothing, and clothing implies washing, and washing, water; but in a dry country all the water was domestic and therefore measures against the *A. ægypti* were essential and it would not be difficult to eradicate the species even in the land that gave it its name. The breeding-index should be lowered to the safe limit in every town in and near the endemic regions; these measures were assisted by the fact that dengue fever was also transmitted by *A. ægypti* and that it had been successfully treated. Dr. Soper thought that even the most stringent precautions in air transport would not of themselves guarantee immunity; the other preventive measures were essential. The whole question of the prevalence in Africa of the jungle type of yellow fever had not yet become clear and more research was necessary.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Juvenile Training in Schools

In the House of Commons on Feb. 19th Mr. C. S. TAYLOR moved:

That this House is of opinion that a greater degree of technical and physical training should be given to juveniles before leaving school, so that they may be better fitted for the changing conditions of industrial and economic progress.

He said that to work well one must be fit. He felt the necessity for developing in the schools a system of physical training. A standard syllabus approved by the Ministry of Health or Board of Education and administered by qualified instructors would help to produce the bodily fitness which was so desirable. Unqualified instructors might do an immense amount of damage; unsuitable exercises might have a very detrimental effect on the health of the children. It was up to the Government now to press upon the local education authorities the need for expanding physical training. It was time for the Government to make a further appeal to local authorities to provide holiday and school camps for the youth of the country. These camps would supplement the physical efficiency which they all desired. He also asked, must the State rely on public charity for the provision of school playing fields? Building was going on to such an extent that all the available open spaces round our great cities would be occupied unless the Government took steps to remedy this great defect.

Mr. CRAVEN-ELLIS seconded the motion.

Mr. MORGAN said he was not too easy about the glib talk about the Army of physical organisers. He would impress upon the Board of Education this point: physical education was something much more than "physical jerks." To put it in a nutshell, physical training without medical supervision and advice might be very harmful. Mr. Malcolm Stewart, Commissioner for the Special Areas, in his report, referred to children suffering from malnutrition and children with a tendency to tuberculosis. In such cases a set form of physical exercises would be the worst possible thing for the child. With the demand for greater opportunities for physical training

he was in the greatest sympathy, but he did not think they should go mad about it. Do not let it be said that they were training a nation of mechanical robots finely developed from the neck downwards. School existed for something higher and better than that.

Mr. MARKLEW said that the first essential of physical fitness was proper nourishment of the body and a sufficiency of the right kind of food. Let hon. Members turn their attention to measures whereby parents might provide their children with such food. If the elementary needs which were indispensable for physical health were satisfied young children would show how to keep themselves fit by indulgence in that healthy play in which children did not need a great deal of instruction.

Viscountess ASTOR said that the most important of all the subjects before the country to-day was the number of children in the elementary schools who were physically unfit because they were under-nourished or mal-nourished. She was all for fitness, and did not even mind the children being drilled. There were 95,000 children in the elementary schools who were unfit, but they had found a way out. She hoped that they were soon going to see a tremendous development in open-air nursery schools. That was the real proper way to deal with this question.

Mr. OLIVER STANLEY, President of the Board of Education, replying to the debate, said that one of the most important requests which his department made to local authorities in the circular on physical training was the importance of organisation. They did not rely on charity for playgrounds and playing fields for their schools. For a long time local authorities and the State had spent large sums on their provision. Nor was it fair to overlook the amount of actual physical instruction which was given in schools or the amount of time devoted to games out of school hours at the expense of the teachers' time and trouble. He hoped that the circular which the Board of Education had issued would have the effect of stimulating what was already a largely growing interest in physical education, not only games, but training as well. He was sure that the fact that the House would unanimously assent to the motion would be helpful in the campaign in which all of them were interested.

After further debate the motion was agreed to.

The Milk Bill

On Feb. 20th, in the House of Commons, Mr. ELLIOT, Minister of Agriculture, moved the second reading of the Milk (Extension of Temporary Provisions) Bill. He said that the debate on the financial resolution had dealt with the question of nutrition. He fully sympathised with that, but the really important fact was that the industry must be kept going. The milk must exist before it could be distributed. They must also remember that the dairy industry did not consist merely of milk production, but also that of butter and cheese—which were, after all, nutritious, valuable and protective foodstuffs, full of vitamins. If, as had been suggested, the £2,500,000 subsidy given to butter and cheese manufacture were used for subsidising the liquid milk market, that would not solve their problems, it would allow of a reduction of only one quarter of one farthing per cent. in the price of liquid milk; and who would say that such a reduction would lead to an enormous expansion in consumption? It had also been stated that one of the reasons for the lack of success of the milk scheme was that milk for schools was taken into account in computing unemployment allowances, and that consequently parents preferred to maintain their allowances and not to have the free or cheap milk in the schools. He was informed that that was not so. In calculating unemployment allowances the Unemployment Assistance Board ignored entirely the provision of free milk for school-children, and also the provision of milk at a reduced price. The poor-law division of the Ministry of Health stated that it was practically certain that the public assistance committees did not take cheap milk into account in assessing poor relief. Allowing for the fact that the milk-in-schools scheme was operating in the great majority of the large urban schools it was probable that about 92 per cent. of the children attending public elementary schools were in schools where the scheme was in operation. The fact that less than half the children were taking milk was not primarily due to the absence of facilities but to other factors. This emphasised the desirability of having a further period for test and experience, so that they might find out what all the factors were, and thereby be in a better position to deal with them when the Government brought forward their long-term legislation.

Provision of milk for children during week-ends and holidays was already made in the milk-in-schools scheme. The Board of Education proposed in the next half-yearly returns from the schools to ask whether such arrangements were actually made. As to the improvement in the cleanliness of the milk supplied, the right hon. gentleman said that in December last over 25 per cent. of the milk had been brought up to the standard of Grade A or Accredited Milk. In the week ending Feb. 11th there were over 15,000 accredited producers in England and Wales, and they were producing one-third of all the milk sold under wholesale contract for liquid consumption.

The motion which Mr. Alexander was going to move on behalf of the Labour Opposition referred to the desirability of making milk products available at a price within the compass of the lowest income. The policy of the Government had not only been directed towards that end but had secured that end. Without Government assistance there would have been a widespread crash in the dairy and liquid milk industry. During the two years since the House voted this subsidy over 1,000,000 tons of butter and nearly 500,000 tons of cheese had been consumed in this country. If we had bought the butter eaten in the last two years at 1929 prices it would have cost £100,000,000 more. How small in comparison was the rebate which has been given to the producers in this country. At 1925 prices it would have cost £116,000,000 more. Since 1925, and even since 1929, great strides had been made towards the provision of ample supplies within the reach of all.

These calculations were unfamiliar and no doubt would attract attention. They were fundamentally the justification for bringing forward this Bill. As regards malnutrition, he thought that there was a widespread evil of that sort, but he did not think that any dietetic authority would challenge the proposition that a greater proportion of this nation than of almost any other nation in the world was adequately nourished, that that proportion had risen in recent years, and that the nourishment of this country had improved and was improving more rapidly in recent years than it had done in the long periods before. Every speech made by Ministers on the 1934 Act had stressed the importance, from the point of view not only of agriculture but of national health, of the increased consumption of liquid milk, and the milk-in-schools scheme has been a substantial contribution to that end. They all wanted to see the public drinking more milk. That was the main object of this Bill. The problem could not be insoluble and must not be insoluble.

Mr. ALEXANDER moved the following amendment:

That, in the opinion of this House, it is necessary for the improvement of the national physique and for dealing with the widespread evil of malnutrition that the consumption of liquid milk should be increased and encouraged by the provision of ample supplies at a price within the compass of the lowest incomes, and this House therefore declines to assent to the Second Reading of a Bill which merely continues a State subsidy without making provision for the effective reorganisation of milk production or for the establishment of an efficient system of distribution, whereby the public need, and particularly the need of children, expectant mothers, the sick and infirm, may be adequately met.

To anyone concerned with social improvement, he said, it seemed a great anomaly that there should be hundreds and even thousands of families who were unable to get anything approaching an adequate supply of liquid milk, while at the same time milk was being sold at a loss for manufacture at a price so low as 3½d. per gallon. If the Minister admitted the need for a subsidy there was surely a case for widening the extent of the subsidy. They were now supplying milk to schools at ½d. per third-of-a-pint bottle, instead of 1d. as formerly, and yet on the Minister's figures nearly half the school-children were still without milk. He (Mr. Alexander) did not believe that any of the reasons given were as important as that of poverty. He hoped that the Minister would not take the propaganda of the Milk Board on the improvement in the cleanliness of the milk supply as being the whole of the truth. He thought that it was beginning to regularise what had already been introduced for a long time by the important retail and pasteurising organisations in the country. As to the cleaning-up of herds, he believed that a much bigger and a more intensive and scientific scheme was required if they were to get rid of a state of affairs in which 40 per cent. of the herds were reacting to the tuberculin test. There was no doubt that the present price level was too high. The producer needed to be gingered up into more efficient production and a more efficient method of distribution was also necessary. If they were to have a really efficient distribution of clean, healthy bottled milk to all the population, and not merely to sections of it, they must have a real national basis of organised distribution.

After further debate, the amendment was negatived by 201 votes to 121 and the Bill was then read a second time.

In the House of Lords on Feb. 20th the National Pension Fund for Nurses Bill was read a second time.

On Tuesday, Feb. 25th, in the House of Commons the Milk (Extension of Temporary Provisions) Bill passed through Committee.

HOUSE OF COMMONS

WEDNESDAY, FEB. 19TH

Lymph Supplies for Public Vaccination in Scotland

Mr. GROVES asked the Secretary of State for Scotland the name of the firm of lymph manufacturers from whom his department obtained supplies of lymph for vaccination purposes; whether the firm in question held a licence to manufacture lymph under the Therapeutic Substances Act, 1925; and whether he would consider the desirability of obtaining lymph in future from the English Government lymph establishment instead of from private manufacturers.—Sir GODFREY COLLINS replied: The Department of Health obtain their lymph from the Jenner Institute for Calf Lymph, Limited. This firm holds both an importing and a manufacturing licence, under the Therapeutic Substances Act, 1925. The department have found that the keeping qualities of the lymph made by the firm mentioned are peculiarly suited to Scottish needs, and I see no reason therefore to make any change.

Malaria Epidemic in Ceylon

Lieut.-Commander FLETCHER asked the Secretary of State for the Colonies the total number of deaths in Ceylon from malaria between November, 1934, and April, 1935; if he was satisfied that adequate supplies of quinine were available during the whole of this period; and if the report of Colonel Gill on the subject of the malaria epidemic in Ceylon would be published.—Mr. THOMAS replied: During the epidemic it was not possible to secure accurate statistics as to the causes of all the deaths that occurred. Malaria was probably a contributory cause in the case of many deaths attributed to other diseases. I am afraid that I cannot give a more accurate figure than that contained in my reply on Feb. 12th, which indicated the excess of deaths over the normal figure during the epidemic period. Colonel Gill reported that there was never any shortage of quinine. His report has been published as a sessional paper in Ceylon, and I shall be glad to place a copy in the library of the House.

Small-pox and Vaccination of Children

Mr. BROAD asked the Minister of Health how many deaths of children under five years had been registered from small-pox; and how many had been registered as being caused by, or associated with, vaccination since Jan. 1st, 1908, when the present conscience clause came into force.—Sir KINGSLEY WOOD replied: The total numbers for the period from Jan. 1st, 1908, to Dec. 31st, 1935, are 96 and 216 respectively.

Municipal Maternity Homes in Lancashire

Mr. GORDON MACDONALD asked the Minister of Health the number of municipal maternity homes in the administrative county of Lancashire, including the boroughs, in each of the last five years for which figures were available.—Sir KINGSLEY WOOD replied: According to returns furnished to my department by the local authorities, the number of municipal maternity homes in the administrative county of Lancashire, including the non-county boroughs, was 5 in each of the years 1930 to 1934.

Midwives in Lancashire

Mr. GORDON MACDONALD asked the Minister of Health the number of practising midwives in the administrative county of Lancashire, including the boroughs, in each of the last five years for which figures were available.—Sir KINGSLEY WOOD replied: According to returns furnished to my department by the local authorities, the numbers of practising midwives in the administrative county of Lancashire, including the non-county boroughs, have been as follow:—

Year.	Midwives.	Year.	Midwives.
1930	603	1933	625
1931	601	1934	656
1932	610		

Births in Lancashire Municipal Maternity Homes

Mr. GORDON MACDONALD asked the Minister of Health the number of births in the municipal maternity homes in the administrative county of Lancashire, including

the boroughs, during each of the last five years for which figures were available.—Sir KINGSLEY WOOD replied: According to returns furnished to my department by the local authorities, the numbers of births in the municipal maternity homes in the administrative county of Lancashire, including non-county boroughs, were as follow:

Year.	Births.	Year.	Births.
1930	816	1933	922
1931	778	1934	975
1932	865		

Anæsthetics Used in Surgical Operations

Mr. GROVES asked the Home Secretary what anæsthetic was used by Dr. Adli Samaan at University College, London, in the case the report on which was published in the *Journal of Physiology*, August 22nd, 1935, under the title *The Effect of Pituitary, Posterior Lobe*.—Mr. GEOFFREY LLOYD, Under Secretary, Home Office, replied: I am informed that the operations described in the paper to which the hon. Member refers were, as stated in the footnote on page 37, performed by Dr. G. W. Theobald, and that they were performed under full anæsthesia after a preliminary injection of morphine, the anæsthetics being chloroform and ether.

THURSDAY, FEB. 20TH

Colliery Employee and Pneumoconiosis

Mr. HOPKIN asked the Home Secretary if he was aware that Sidney Norton, recently employed at the Great Mountain Colliery, Tumble, had been certified as suffering from pneumoconiosis in the third stage; that Norton had worked for the last 14 years on the screens but did not come under the Silicosis Order and would therefore not receive compensation; and would he consider amending the above order to include men who worked in or about the mine.—Sir JOHN SIMON replied: This case has not, I understand, been before the Medical Board, and I have no information in regard to it. The Home Office is not in possession of any evidence that work on the coal screens gives rise to silicosis, but if the hon. Member will send me particulars of the case, including the medical certificate, I will consider them and, if necessary, inquire further into the matter.

Mr. E. J. WILLIAMS: Will the Home Secretary give attention to the whole question, as there is great dissatisfaction in all areas that these respiratory diseases are leading to this particular form of disability?

Sir J. SIMON: As a matter of fact I have had the matter very much under my attention in connexion with various cases, but I was only aware of this particular matter when I saw the question.

Mr. WILLIAMS: Is the right hon. gentleman aware of the case recently decided in the High Court, and if so will he further consider revising the Order?

Sir J. SIMON: It was to the Court of Appeal that the decision was referred.

Mr. WILLIAMS: To the House of Lords.

Sir J. SIMON: No, not the House of Lords. The matter has recently been before the Home Office and gone into very fully with the representatives of the men.

Publication of Offensive Evidence in the Courts

Mr. DAY asked the Home Secretary whether he would consider introducing legislation to amend the present procedure in the courts so as to provide that all evidence of a shocking or offensive character in cases of alleged murder or other serious felonies should be taken in camera.—Sir JOHN SIMON replied: No, Sir. I do not consider that it would be in the public interest to amend the law in the sense suggested. If the hon. Member has in mind the control of newspaper reports, I doubt if legislative restrictions could properly go beyond the provisions on the subject in the Judicial Proceedings (Regulation of Reports) Act, 1926.

Mr. DAY: Does not the right hon. gentleman consider that the publication of some of the details in these cases has a bad influence upon younger minds?

Sir J. SIMON: I think that the hon. gentleman had better look at the section in the Judicial Proceedings Act, 1926, which will cover a great deal he has in mind.

Expressions of Opinions by Coroners and Juries

Sir JOHN HASLAM asked the Home Secretary whether, in view of the recent case when a coroner and the coroner's jury inquiring into the death of a footballer censured the conduct of a football referee, and in view of other such cases, he would introduce legislation to prevent coroners or their juries expressing any such opinions or taking any action other than to ascertain the cause of death of the deceased.—Sir JOHN SIMON replied: The recent report of the Departmental Committee on Coroners contains recommendations on the subject matter of my hon. friend's question, and this report is at present under consideration.

Sir J. HASLAM: May I ask whether from his unrivalled experience as a lawyer and in his present office the right hon. gentleman does not think it is desirable that something should be done so that people are not condemned by a coroner in public in their absence, and also that a coroner's jury should not be allowed to express an opinion when the accused has never been invited to attend the inquiry?

Sir J. SIMON: The report of the Committee on Coroners discusses this matter, and these considerations are fully set out.

Mr. RITSON: Is the right hon. gentleman aware that a jury was only stopped from giving their verdict by a very clever handling on the part of the police; that some of us were there on that occasion, and before he condemns the coroner will he ask for further evidence?

No further answer was given.

Maternal Mortality

Mr. GEORGE GRIFFITHS asked the Minister of Health the number of deaths from and arising out of childbirth for the years ended Dec. 31st, 1932, 1933, 1934, and 1935.—Sir KINGSLEY WOOD replied: The following are the number of deaths registered in England and Wales. A.—Classified to pregnancy and childbearing. B.—Not so classified but returned as associated with those conditions.

	A.	B.
1932	2587	713
1933	2618	828
1934	2748	747
1935	Not yet available.	

Hospitals and Ambulance Services

Sir PERCY HARRIS asked the Minister of Health whether his attention had been called to the recent case that came before the Stepney coroner of a woman having to wheel the dead body of her child through the streets to the London Hospital for a post-mortem examination because the hospital was not able to provide an ambulance; and whether he would endeavour to see that there was closer coöperation between the private hospitals and the municipal ambulance to prevent incidents of this character.—Sir KINGSLEY WOOD replied: I have seen a newspaper report of this case and am making inquiries. I will communicate with the hon. Member when I am more fully informed of the circumstances.

Insanitary Slum Dwellings in Bethnal Green

Sir PERCY HARRIS asked the Minister of Health whether his attention had been called to a lot of bad slum courts in Bethnal Green which had been the subject of a survey by the Bethnal Green Housing Association, especially to Busby-square, where the total population appeared to be 53 persons in 1 three-room and 10 two-room houses, the area of the site being 2686 square feet, including the yard, &c.—i.e., one-sixteenth of an acre; whether he was aware that the lavatory arrangements were in a most unsatisfactory condition; whether he could find out if anything could be done to provide alternative accommodation for the people living under these conditions; and whether, when that was available, the court could be cleared.—Sir KINGSLEY WOOD replied: My attention has been called to this matter. The London County Council and the Bethnal Green borough council are engaged in dealing in close coöperation with slum areas in the borough. I understand that the area referred to will be dealt with as soon as practicable.

Sir P. HARRIS: Does not the right hon. gentleman realise that this is a very special cases and that it should have priority over other case that are not so urgent, because of the appalling conditions prevailing?

Sir K. WOOD: I have no doubt that the London County Council and the Bethnal Green borough council have this matter in hand.

Milk Designation Order

Mr. THOMAS WILLIAMS asked the Minister of Health whether his attention had been called to the recent criticisms of the new Milk Designation Order; and would he undertake to re-examine the question, with a view to helping the campaign for pure milk instead of deteriorating the standard already attained.—Sir KINGSLEY WOOD replied: Various representations have been made to me on the draft Milk (Special Designations) Order, and they will have my fullest consideration before the Order is finally settled.

Voluntary Hospitals and General Nursing Council Rules

Mr. BOULTON asked the Minister of Health if he was able to give an undertaking that the boards of management of the principal voluntary hospitals of the country should be consulted before any action was taken to amend Rule No. 4 (1) of the Nurses Registration Act, 1919, or before it became law.—Sir KINGSLEY WOOD replied: I do not think it necessary to adopt the course suggested by my hon. friend. The proposed new Rule 4 (1) (a) of the General Nursing Council, to which I presume he is referring, has been published in the press, and it is open to any interested party who objects to the rule to make representations to me before I approve it under the Act. I may add that the voluntary hospitals are represented on the General Nursing Council.

Prevention of Silicosis

Mr. HOPKIN asked the Secretary for Mines if he was aware that a number of men from 25 to 35 years of age were being certified as suffering from silicosis in the anthracite district of South Wales; and what practical steps were being taken to deal with the prevention of this disease.—Captain CROOKSHANK replied: The answer to the first part of the question is Yes. As regards the second part, I would refer the hon. Member to my reply to his question of Feb. 13th.

Diabetic Patients and Motor-car Driving

Mr. GROVES asked the Minister of Transport, in view of the fact that from time to time drivers of motor-cars were prosecuted on the ground of being in charge of a motor-car while under the influence of drink, and in defence it was stated that their condition was due to the effect of insulin dosage, whether he would make it a condition for granting a licence to a diabetic under insulin treatment that he should state this in the declaration as to physical fitness required when applying for a driving licence.—Mr. HORR-BELISHA replied: On the facts placed before me, I do not think that I should have sufficient ground for taking the course recommended by the hon. gentleman.

MONDAY, FEB. 24TH

Protective Measures against Air Attack

Captain MACNAMARA asked the Home Secretary, in view of the fact that the Army, the Royal Air Force, the police, ambulance and hospital services, decontamination squads, &c., were administered by the War Office, Air Ministry, Home Office, and Ministry of Health, often working through local authorities, had any arrangements been made by districts for all such services to be under the actual command of one officer in the event of an air attack on this country; if so, was such an officer given facilities for the coördinated training of these services in peace time; and who was the official responsible at present in any district for ordering a black-out in the event of a sudden air attack.—Mr. G. LLOYD, Under-Secretary, Home Office, replied: Subject to general guidance from the Air Raids Precautions Department of the Home Office, the responsibility for working out and

coördinating necessary measures of precaution against the emergency of air attack rests with the various local authorities. The question of the form of executive organisation to be adopted in the event of war is under consideration. With regard to the last part of the question, it would fall to the Secretary of State for the Home Department in time of war to issue any general orders that might be necessary for the regulation and restriction of lighting. It would be the duty of the chief officer of police in each district to make the necessary arrangements for giving effect to any such orders.

TUESDAY, FEB. 25TH

Free Meals for School-children in Greenock

Mr. DAVIDSON asked the Secretary of State for Scotland the total number of school-children in Greenock receiving free meals as necessitous cases.—Colonel COLVILLE, Under-Secretary of State for Scotland, replied: The number of children receiving free meals on the 20th of this month was 163. In addition, about 4000 receive free milk under a scheme approved under the provisions of the Milk Act, 1934.

MEDICAL NEWS**University of Cambridge**

On Feb. 22nd the following degrees were conferred:—

M.D.—W. S. C. Copeman, G. D. Kersley, Frank Goldby, and E. S. Stern.

M.B., B.Chir.—E. J. Currant, B. H. Page, and J. B. C. Murdoch.

M.B.—W. I. Bain, J. H. Walters, and G. O. Brooks.

B.Chir.—A. F. Bryson and P. G. Scott.

University of London

The university chair of dietetics tenable at St. Thomas's Hospital medical school is to be transferred to University College Hospital medical school for five years.

Mr. H. L. Eason has been reappointed representative of the University on the General Medical Council.

On March 2nd, at 5 p.m., at University College, Gower-street, W.C., Dr. Charles Reid will give the first of four Monday lectures on the endocrine organs in relation to metabolism.

Society of Apothecaries of London

At recent examinations the following candidates were successful:—

Surgery.—H. Bentovim and H. Burrows, Univ. of Manch.; and O. A. L. Goode, Univ. of Leeds.

Medicine.—H. A. Koretz, Univ. of Manch.

Forensic Medicine.—H. A. Koretz, Univ. of Manch.

Midwifery.—H. A. Bhattacharji, Univ. Coll. Hosp.; J. A. G. Gulliford, Welsh National School of Medicine; and J. F. O'Malley, Guy's Hosp.

H. Burrows and O. A. L. Goode, having completed the final examination, are granted the diploma of the society entitling them to practise medicine, surgery, and midwifery.

Royal College of Surgeons of England

On Monday, March 2nd, Mr. C. E. Shattock will open the spring course of museum demonstrations at the Royal College of Surgeons by showing specimens illustrating cysts. On the following three Fridays Dr. A. J. E. Cave will deal with the anatomy of cervical rib and of certain vertebral joints and the significance of the facial musculature. Dr. L. W. Proger will demonstrate tumours of the kidney on Monday, March 16th, and on March 23rd new additions to the museum. The demonstrations will be held in the College, Lincoln's Inn-fields, London, W.C., at 5 p.m., and they are open to advanced students and medical practitioners.

University of Glasgow

It is announced that the number of students to be admitted to the first-year courses in medicine in October, 1936, will be limited and that forms of application for permission to commence the study of medicine, which may now be obtained from the registrar, must be returned by applicants not later than July 1st, 1936.

On the recommendation of the faculty of medicine the senate has resolved to add the subject of tropical diseases to the list of special departments from which a candidate may elect to be examined for the M.D. degree.

Post-graduate Course in Paris

A fortnight's course on the medical and hydrological treatment of digestive and nutritional disorders will begin on May 4th at the Hôpital Necker under the direction of Prof. Maurice Villaret. May 17th to 19th will be spent at Vichy where the last two lectures of the course will be given. Further information may be had from the Laboratoire d'Hydrologie et de Climatologie thérapeutiques, Faculté de Médecine, Paris.

British Institute of Philosophy

An address entitled *Vice and Illusion* will be given by Prof. Gilbert Murray on Tuesday, March 10th, at 8.15 p.m., at University College, Gower-street, London, W.C. Cards of admission may be had from the director of studies at University Hall, 14, Gordon-square, W.C.1.

Royal Sanitary Institute

A meeting of this institute will be held in the town hall, Ipswich, on Saturday, March 14th, at 2.30 p.m., when Mr. E. McLauchlan will open a discussion on the disposal of house refuse by controlled tipping, and Dr. A. M. N. Pringle a discussion on baths and bath water.

Public Food Service in Russia

At 8 p.m. on Thursday, March 12th, at the house of the Royal Society of Arts, 18, John-street, Adelphi, Mr. F. Le Gros Clark, hon. secretary of the Committee Against Malnutrition, will lecture on *Men, Medicine, and Food in the Soviet Union*. Tickets may be had from the committee at 19c, Eagle-street, London, W.C.1.

Microchemical Club

The third annual general meeting of this club will be held in the department of plant physiology at the Imperial College of Science and Technology, South Kensington, on Saturday, March 14th, at 11 a.m. The programme will include a lecture by Mr. C. Ainsworth Mitchell, D.Sc., on the microchemical examination of inks and handwriting.

Course in Psychological Medicine

The second part of the course of instruction for a diploma in psychological medicine, which has been arranged by the London County Council and is being held at the Maudsley Hospital, Denmark Hill, S.E., starts on March 2nd and will continue till May 25th. Further information may be had from Dr. F. Golla, hon. director of the medical school at the Maudsley Hospital.

Sir Charles Hastings Lecture

Prof. Winifred Cullis and Dr. R. Cove-Smith will deliver the eighth Sir Charles Hastings lecture at the house of the British Medical Association, Tavistock-square, London, W.C., on Tuesday, March 10th, at 8 p.m. Their subject will be *Keeping Fit*. Tickets may be had from the financial secretary of the B.M.A.

Demonstrations of Contraceptive Technique

On Thursday, March 5th, at 2.30 p.m., a practical demonstration of the technique of the use of a variety of contraceptive methods will be given by Mrs. Marie Stopes, D.Sc., and Dr. Evelyn Fisher at the clinic of the Society for Constructive Birth Control. Medical practitioners and senior students should apply for tickets to the hon. secretary of the society at the clinic, 108, Whitfield-street, London, W. 1.

A Debate on Euthanasia

At a meeting of the Law Students' Debating Society held in London on Feb. 18th Dr. C. Killick Millard, as a visitor, proposed "that in the interests of humanity it is desirable that voluntary euthanasia should be legalised, subject to adequate safeguards, for persons who are suffering from incurable, fatal and painful disease." Mr. A. L. Ungoed Thomas opposed the motion, and after discussion it was carried by one vote.

State Medical Faculty of Bengal

This faculty has instituted a fellowship examination (to be taken in medicine or surgery) for candidates who seek a post-graduate qualification equivalent in status to a university doctorate. Further particulars may be had from the secretary of the faculty at Grosvenor House, Calcutta.

Eugenics Society

At a meeting of this society to be held on Tuesday, March 17th, at 5.15 p.m., at the rooms of the Linnean Society, Burlington House, Piccadilly, London, W., Mr. D. Caradog Jones will speak on Eugenics and the Merseyside Enquiry. Mr. A. Bradford Hill, D.Sc., is to be in the chair.

British Postgraduate Medical School

On Mondays, at 2.30 p.m., beginning on March 2nd, Dr. Gordon Holmes, F.R.S., will give five lectures on cerebro-spinal syphilis, and on Fridays, at 5 p.m., beginning on March 20th, Sir James Walton will give six lectures on surgical aspects of dyspepsia. A course of 13 lectures on recent advances in obstetrics and infant hygiene (of which particulars will be found weekly in our Medical Diary) will be opened on Monday also, when Dr. Leonard Colebrook will discuss puerperal sepsis. Four lectures on the hygiene of the new-born child will be delivered by Dr. Alan Moncrieff from March 27th to April 24th. Further particulars of all these courses may be had from the Dean of the School, Duane-road, London, W. 12.

A Conference on Climatophysiology

The first All-Union Conference on Climatophysiology and Climatotherapy has recently been held in Moscow. "The problem of climate," said Prof. I. P. Razenkov, assistant director of the All-Union Institute of Experimental Medicine, in his opening speech, "is a vital problem of modern medicine. And in our country, with the great variety of climate in its different regions, these problems are of particular importance." A report by Prof. N. E. Marshak was devoted to the climatophysiological problems associated with the rapid industrial growth of the Soviet Union and the development and peopling of its borderlands, and also with the extensive use of climate in the prevention and cure of disease. The other communications presented to the Congress included observations on the climatic treatment of tuberculosis and of renal diseases, on physiological data obtained by the 1935 Pamir expedition, on climatotherapeutic research in Georgia, and on the effect of climatic conditions on treatment with ultra-violet rays.

Joint Tuberculosis Council

After discussing a number of present-day problems, including the new milk designations and the risk run in nursing tuberculous cases, the council lunched together on Feb. 22nd at the Hotel Russell, under the genial chairmanship of Dr. G. Lissant Cox. In replying for the guests, Dr. Arthur MacNalty said that the idea of having a council of all those interested was a great step forward in a national antituberculosis scheme. It was Dr. Ernest Ward's great idea and he was happy himself to have been the first representative of the Ministry of Health on the council, which had led to a better understanding of the aims and uses of the sanatorium-hospital and the place of after-care. The village settlement, he said, fully demonstrated the value of such work. Sir Henry Gauvain, in proposing The Council, excused himself from speaking to the toast in the phrase "we know we're all very good fellows and we needn't rub it in," and then told entertaining stories of his recent journey round the world. Dr. Ward, replying, recalled a M.O.H.'s remark to him, "Your work is easier than mine; it is static," and thus stimulated sought new fields of activity. The tuberculosis-rate was falling (not, it was true, as fast as in Italy), but had intensive pneumothorax treatment led to any acceleration in the fall? Some 10 per cent. of cases were infected from a known source; where did the remaining 90 per cent. get infected? In some cases where treatment was refused (but radiography permitted) he had watched the disease fade away; could the reason for this be discovered? Dr. C. O. Hawthorne proposed the health of the chairman.

THE King has granted permission to Colonel Philip Henry Mitchiner, T.D., M.S., surgeon to St. Thomas's Hospital, London, to wear the insignia of the second class of the Order of St. Sava, conferred on him by the King of Yugoslavia in recognition of his services.

Woolwich War Memorial Hospital

More accommodation is badly needed at this hospital, for the number of cases in every department was greater in 1935 than in 1934. There was a specially large increase in the number of out-patient attendances.

Ophthalmological Congress

The second Internationale Kongress für Irisdiagnostik, which was postponed last year, will be held on May 28th and 29th in Nuremberg. Further information may be had from J. Steen, Leubnitzerstr. 2, Dresden, A 24.

Chadwick Public Lectures

On Thursday, March 19th, at the Royal United Service Institution, Whitehall, London, S.W., at 5.30 p.m., Dr. Arthur MacNalty will give a public lecture under the auspices of this trust. He will speak on epidemic poliomyelitis and Sir James Crichton Browne, F.R.S., will be in the chair. On April 2nd, at 8.15 p.m., Mr. Lionel Pearson will speak on modern hospital construction at the Royal Institute of British Architects, 66, Portland-place, W. The lectures are open to all, and further particulars may be had from Mrs. Aubrey Richardson, O.B.E., at the offices of the trust, 204, Abbey House, Westminster.

Lectures on Women's Health

A series of lectures on this subject will be delivered under the auspices of the Royal Institute of Public Health and the Institute of Hygiene at 28, Portland-place, London, W., on Wednesdays, from March 4th to April 8th, at 3.30 p.m. The lecturers will be Mr. Aubrey Goodwin (the health of the married woman), Prof. Winifred Cullis (women in industry), Dr. G. W. Theobald (some effects of emancipation on the health of married women), Dr. J. F. Halls Dally (psychological influences on the circulation), Dr. R. Fortescue Fox (arthritis in women), and Prof. James Young (sociological problems affecting women's health). The lectures are open to all who are interested in health problems.

Appointments

- BRINTON, D., B.M. Oxon., M.R.C.P. Lond., has been appointed Neurologist to the Croydon General Hospital.
- CASE, R. M., M.B. Birm., Resident Medical Officer at the Leicester General Hospital.
- ELLIS, R. W. B., M.D. Camb., M.R.C.P. Lond., Physician to the Infants Hospital, Vincent-square, London.
- EVANS, C. D., M.B. Camb., Hon. Medical Registrar at the Royal United Hospital, Bath.
- GILPIN, A., M.D., M.R.C.P. Lond., Assistant Physician to the Croydon General Hospital.
- HARRIS, CHARLES, M.D., F.R.C.P. Lond., Physician to the Infants Hospital, Vincent-square, London.
- LAST, S. L., M.D. Berlin, L.R.C.S. Edin., D.P.M. Eng., Second Assistant Medical Officer at the Mental Hospital, Berry Wood, Northampton.
- MOORE, JOCELYN, M.B. Lond., F.R.C.S. Eng., M.C.O.G., Assistant Physician for Diseases of Women to the London Homeopathic Hospital.
- ROBERTS, L. V., M.B. Edin., Resident Medical Officer at the Leicester General Hospital.
- ROPER, R. D., M.B. Camb., Hon. Anaesthetist to Charing Cross Hospital.
- ROSENKRANZ, K., M.D. Freiburg, L.R.C.P. Edin., Assistant Radiologist at the Elizabeth Garrett Anderson Hospital.
- WHITTAKER, DUNCAN, M.R.C.S. Eng., Junior Assistant Physician at the Bethlem Royal Hospital.
- London Skin Hospital.*—The following appointments are announced:—
DUCKWORTH, GEOFFREY, M.R.C.P. Lond., Hon. Physician; MURRAY, J. F., M.B. Irel., Hon. Assistant Physician; and DUNN, J. H., M.D. Belf., M.R.C.P. Lond., Registrar.
- Southend General Hospital.*—The following appointments are announced:—
EVANS, WILLIAM, M.D., F.R.C.P. Lond., Hon. Physician; WHEELER, SIR WILLIAM, M.D. Dub., F.R.C.S. Irel., Hon. Surgeon; O'REILLY, J. N., B.M. Oxon., M.R.C.P. Lond., Hon. Physician in Diseases of Children; BARLOW, D. S., M.S. Lond., F.R.C.S. Eng., General Surgeon; BOND, L. T., M.B. Camb., Pathologist; and STRÖM-OLSEN, R., M.D. Wales, D.P.M., Hon. Psychiatrist.
- Certifying Surgeons under the Factory and Workshop Acts: Dr. J. O. McDONAGH (Stanley District, Perth) and Dr. N. ANDERMAN (Lynton District, Devon).

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, March 3rd.

Pathology. 8.15 for 8.30 P.M. (National Institute for Medical Research, Mount Vernon, N.W.). P. P. Laidlaw: 1. A Group of Filtrable Organisms. 2. An Anaerobic Method for Plates. W. J. Elford and M. Schlesinger: 3. Purified Preparations of Bacteriophage. F. F. Tang: 4. Filamentous Forms of Pleuropneumonia. C. H. Andrews: 5. Malignant Transformation of Virus-induced Papilloma of the Rabbit. 6. Immunisation of Mice against Influenza Virus. S. E. B. Balfour Jones: 7. Rat Leprosy in Hamsters. J. E. Barnard: 8. Microscopic Appearances of Some Viruses. P. Bruce White: 9. Polysaccharides from Cholera Vibrios. J. R. Perdrau: 10. Australian X-disease. A. S. Parkes and S. Zuckerman: 11. Changes in the Primate Prostate Caused by Estrone and their Suppression by Male Hormone.

Orthopaedics. 8.30 P.M. Mr. George Perkins and Mr. R. Watson Jones: Fractures in the Region of the Shoulder-joint.

WEDNESDAY.

History of Medicine. 5 P.M. Prof. Millais Culpin: The History of Psychology in Medicine.

Surgery. 8.30 P.M. Mr. Ian Aird, Mr. G. C. Knight, Mr. David Slome, and Mr. R. St. Leger Brockman: Intestinal Strangulation.

THURSDAY.

Tropical Diseases and Parasitology. 8 P.M., Special Meeting. 8.30 P.M., Colonel S. P. James: Clinical and Parasitological Observations Applicable to the Study of Malaria Epidemics.

FRIDAY.

Otology. 10.30 A.M. (Cases at 9.30 A.M.) Dr. G. Kelemen (Budapest) and Dr. E. A. Blake Pritchard: Disturbances of Function of the Ear following Injury.

Laryngology. 5 P.M. (Cases at 4 P.M.) Dr. A. Brown Kelly, Dr. G. Kelemen, Mr. V. E. Negus, and Mr. G. H. Steele: Non-malignant Obstruction of the Oesophagus.

Anaesthetics. 8.30 P.M., Clinical Meeting.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.

MONDAY, March 2nd.—9 P.M., Dr. P. H. Manson-Bahr: The Differential Diagnosis of Diseases of the Colon (Dysentery and Colitis) and their Complications, with Special Reference to Treatment (last Lettsomian lecture).

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.

FRIDAY, March 6th.—8.45 P.M. (West London Hospital), Clinical and Pathological Meeting. (Cases at 8 P.M.)

SOCIETY OF CHEMICAL INDUSTRY (London Section).

MONDAY, March 2nd.—8 P.M. (Burlington House, Piccadilly, W.), Dr. T. A. Henry: The Chemotherapy of Malaria.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.

TUESDAY, March 3rd.—5 P.M., Dr. E. L. Middleton: Industrial Pulmonary Disease due to the Inhalation of Dust, with Special Reference to Silicosis (last Milroy lecture).

THURSDAY.—5 P.M., Dr. R. A. McCance: Medical Problems in Mineral Metabolism (first Goulstonian lecture).

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.

MONDAY, March 2nd.—5 P.M., Mr. C. E. Shattock: Specimens Illustrating Cysts.

FRIDAY.—5 P.M., Dr. A. J. E. Cave: The Anatomy of Cervical Rib (Museum demonstrations).

UNIVERSITY OF LONDON.

MONDAY, March 2nd.—5 P.M. (University College, Gower-street, W.C.), Dr. Charles Reid: The Endocrine Organs in Relation to Metabolism (first of four lectures).

TUESDAY.—5 P.M., Dr. R. Kuczynski: Recent Population Trends (first of three lectures).

INSTITUTE OF HYGIENE, 28, Portland-place, W.

WEDNESDAY, March 4th.—3.30 P.M., Mr. Aubrey Goodwin: The Health of the Married Woman.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.

MONDAY, March 2nd.—2.30 P.M., Dr. Gordon Holmes, F.R.S.: Cerebro-spinal Syphilis (first of five lectures). 3.30 P.M., Dr. Leonard Colebrook: Puerperal Sepsis.

WEDNESDAY.—3.30 P.M., Mr. Eardley Holland: Haemorrhage of Late Pregnancy.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.6.

MONDAY, March 2nd.—10 A.M., Skin clinic. 11 A.M., Surgical wards. 2 P.M., Gynaecological and surgical wards, gynaecological and eye clinics.

TUESDAY.—10 A.M., Medical wards. 11 A.M., Surgical wards. 2 P.M., Throat clinic.

WEDNESDAY.—10 A.M., Children's ward and clinic. 11 A.M., Medical wards. 2 P.M., Eye clinic, gynaecological operations.

THURSDAY.—10 A.M., Neurological and gynaecological clinics. Noon, Fracture clinic. 2 P.M., Eye and genitourinary clinics. 4 P.M., Venereal diseases.

FRIDAY.—10 A.M., Medical wards and skin clinic. Noon, Lecture on treatment. 2 P.M., Throat clinic. 4.15 P.M., Mr. Vlasto: Haemorrhage from the Upper Respiratory Tract.

SATURDAY.—10 A.M., Children's and surgical clinics, Medical wards.

Daily, 2 P.M., Operations, Medical and Surgical Clinics. The lectures at 4.15 P.M. are open to all medical practitioners without fee.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

WEDNESDAY, March 4th.—2 P.M., Dr. B. E. Schlesinger: Croup. 3 P.M., Dr. D. N. Nabarro: Purity of Milk-supply.

Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, March 2nd.—3.30 P.M., Dr. Kinnier Wilson: Some Heredo-familial Diseases (IV.) Cerebellar Spinal.

TUESDAY.—3.30 P.M., Mr. Julian Taylor: Spinal Compression.

WEDNESDAY.—3.30 P.M., Dr. Kinnier Wilson: Clinical Demonstration.

THURSDAY.—3.30 P.M., Mr. Leslie Paton: Optic Atrophy.

FRIDAY.—3.30 P.M., Dr. Purdon Martin: Disseminated Sclerosis.

Out-patient clinic daily at 2 P.M.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.

TUESDAY, March 3rd.—5.30 P.M., Dr. J. M. H. Campbell: The Use of Quinidine in Fibrillation.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL, N.W.

WEDNESDAY, March 4th.—4 P.M., Dr. Ralph Noble: Some Psychological Principles in General Medicine.

ST. JOHN CLINIC, Ranelagh-road, S.W.

FRIDAY, March 6th.—4.30 P.M., Mr. H. J. Taylor, Ph.D.: The Physical Basis of Electric Treatments, including Diathermy and Ultra-short Waves.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.

WEDNESDAY, March 4th.—4 P.M. (St. James's Hospital, Ouseley-road, S.W.), Mr. V. Z. Cope: Demonstration of Surgical Cases.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, March 2nd, to SATURDAY, March 7th.—INFANTS HOSPITAL, Vincent-square, S.W. Mon., Wed., and Fri., at 8 P.M., primary F.R.C.S. course in anatomy and physiology.—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W. Tues., 8.30 P.M., Mr. Hamilton Bailey: Testicle and Prostate. Thurs., 8.30 P.M., Mr. T. Meyrick Thomas: Breast (M.R.C.P. clinical course at 8 P.M.).—WEST END HOSPITAL FOR NERVOUS DISEASES, Welbeck-street and Regent's Park.—Afternoon M.R.C.P. course in neurology and psychopathology.—BROMPTON HOSPITAL, S.W.—Week-end course in chest diseases.—Courses are open only to members of the Fellowship.

MANCHESTER ROYAL INFIRMARY.

TUESDAY, March 3rd.—4.15 P.M., Mr. P. R. Wrigley: Chronic Abdominal Pain.

FRIDAY.—4.15 P.M., Mr. A. Graham Bryce: Demonstration of Surgical Cases.

ANCOATS HOSPITAL, Manchester.

THURSDAY, March 5th.—4.15 P.M., Mr. E. S. Brentnall: Fractures of the Spine.

LEEDS GENERAL INFIRMARY.

TUESDAY, March 3rd.—3.30 P.M., Mr. Armitage: (1) Injection Therapy in the Treatment of Hemorrhoids and Varicose Veins. (2) Demonstration of Some Surgical Cases.

LEEDS PUBLIC DISPENSARY.

TUESDAY, March 4th.—4 P.M., Dr. H. G. Garland: Neuritis—the Common Causes, Prognosis, and Treatment.

UNIVERSITY OF DURHAM.

SUNDAY, March 8th.—10.30 A.M. (Newcastle General Hospital), Dr. W. G. A. Swan: Selected Medical Cases.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.

WEDNESDAY, March 4th.—4.15 P.M. (Western Infirmary), Dr. John Gracie: Nephritis.

CONGRESS OF COMPARATIVE MEDICINE.—The third International Congress of Comparative Medicine will take place in Athens from April 15th to 18th under the presidency of Prof. W. Bensis. The last meeting of the congress will be held at Epidaurus. Twenty-eight nations, including Great Britain, will be officially represented, and a British committee is being formed under the chairmanship of Lord Dawson. The official representatives of the British Government are: Mr. F. P. Brooks, F.R.S., Dr. N. Hamilton Fairley, and Prof. F. C. Minett, and those contributing to the proceedings will include Lieut.-Colonel H. E. Short. Further information can be had from the secretary of the British committee, Dr. A. P. Cawadiaz, 52, Wimpole-street, London, W.1.

NOTES, COMMENTS, AND ABSTRACTS

PASTEURISING PLANTS

THE apparent failure of pasteurisation of milk between 145° and 150° F. for 30 minutes to destroy tubercle bacilli has been recorded by various investigators.¹ Since others have obtained consistently negative results when examining milk from efficiently designed and operated pasteurising plants under the same conditions of time and temperature, it seems likely that failure to destroy the tubercle bacilli is an indication of a bad design or inexpert operation of the apparatus. In order to test this hypothesis A. W. Scott and N. C. Wright have examined 19 holding plants in 4 Scottish cities. The outcome of their investigations is set out in a special report to the Hannah Dairy Research Institute.² Some of the conclusions reached are summarised below.

Filtration.—Milk is usually weighed at a platform and then transferred into a receiving tank after passing through a coarse filter designed to remove large particles. Such filters should not be constructed of copper for fear of tainting the milk. The receiving tank should be sufficiently large in relation to the capacity of the rest of the plant to ensure a steady, unbroken supply of milk into the heating apparatus throughout the run. Milk is generally circulated by means of force pumps. Pumps having a long suction lead are undesirable owing to the danger of air leaks developing at joints and consequent contamination of milk from the air. Nor is it desirable to pass milk through a pump after pasteurisation owing to the danger of contamination from the working parts of the machine. Milk should flow by gravity through the cooling and bottling apparatus. Careful filtration or clarification of milk prior to pasteurisation is most necessary. For this purpose cloth filters or centrifugal separators may be used. There is no agreement as to which constitutes the more satisfactory type, but whichever method of cleansing is used it should be carried out at as low a temperature as possible so as not to interfere with the cream-line of the resulting product.

Milk may be pre-heated to the requisite temperature and then passed into holding tanks, or it may receive all the heating in the holder. Four types of *heating apparatus* were examined—viz., kettle heaters, plate heaters, tubular heaters, and batch pasteurisers. The first three types depend upon the rapid passage of a thin layer of milk through a narrow space with suitably heated walls. In the batch pasteuriser a vat of milk is heated by a steam jacket, circulation being assisted by rotary paddles, or by rotating heated coils. The heating of the walls in the first three types—i.e., the pre-heaters—is effected by a system of jacketing with hot water or with steam. If circulating hot water is used, and provided the temperature of the water is thermostatically controlled, these types of pre-heaters raise the milk to an extremely constant temperature. Where tanks are heated directly automatic thermographs should be installed.

As regards *holding tanks* to which milk is passed following "pre-heating," their object is to retain the milk at a temperature between 145° and 150° F. for a minimum of 30 minutes. A single tank is generally used for this purpose which is jacketed with steam or hot water. Provided that the correct temperature is maintained in the main bulk of the milk throughout the run, survival of tubercle bacilli can generally be explained by the existence of dead spaces, faults in the inlet or outlet valves, poor mixing, or excessive foam formation. A dead space is a portion of the milk where circulation is suppressed and which does not reach the required temperature. Such spaces are generally associated with leads to the valves and can be avoided by fitting such valves

flush with the sides of the tank. The valves themselves should not leak; or any milk which leaks must be allowed to run to waste. Adequate stirring of the milk is necessary, but foam formation must be avoided, whilst measures should be taken to avoid contaminating milk with grease or dirt from the bearings of the stirring paddles. Where foam is formed tubercle bacilli and thermophilic organisms may escape destruction through not being sufficiently heated in the protecting foam; formation of this foam can be avoided by a suitable design of the inlet valve and the stirring apparatus, or else the space above the milk in the holder must be adequately heated, in which case foam formation ceases to matter. It was found that thermometers and thermographs used in the various plants showed striking errors of reading, which emphasises the need for frequent checking of such instruments against standard thermometers. In order to ensure constant temperatures all heating processes should be thermostatically controlled, whilst the holder tank should be fitted with a thermograph and a direct reading maximum and minimum thermometer. As regards the duration of heating, it is emphasised that the regulations demand that all milk shall be held at the required temperature for a minimum period of 30 minutes *exclusive* of the time taken to fill and to empty the holder.

Two types of *cooling apparatus* were studied, the one where milk trickles over the surface of corrugated plates cooled by a brine jacket and is exposed to the atmosphere, the other in which the milk is cooled internally. Both types cooled the milk satisfactorily, and the contact between the atmosphere and the milk in the first type had less influence upon the bacterial content of the finished product than might have been expected. The important consideration is the adequate cleansing of the apparatus. To avoid contamination of milk with organisms pathogenic to human beings an internal cooling system is desirable. As regards the bottling apparatus, the design of the apparatus is of secondary importance compared to the necessity of adequate cleansing. An obvious corollary to this point is that the apparatus, and in particular the delivery valves, should be designed with a view to easy cleansing. This remark applies to every piece of apparatus and every pipe through which the milk is passed.

In judging the *suitability of milk* received for pasteurisation, attention should be paid not only to the pre-pasteurisation bacterial count, since that is frequently an unfair index of the conditions under which the milk has been produced, but also to the post-pasteurisation count of heat resistant organisms. The former count is largely influenced by weather conditions, but the thermophilic organisms come from dust and from badly sterilised apparatus, so that a high count of these organisms indicate strongly that the hygiene of production has been bad.

It is suggested that the dairy firms would do well to carry out *routine bacterial examinations* of milk after every stage of pasteurisation, for such a procedure would give a reliable check of the efficiency with which the apparatus was functioning. Furthermore, routine examinations should be made by an outside authority in order to create a standard by which the efficiency of pasteurisation may be judged, and in order to give independent evidence of the efficiency of operation of any particular plant. Also it would serve to deter plant operators from becoming careless. In addition to bacterial counts, an estimation of the *coli* content of milk is a useful index of efficiency of pasteurisation. But quite irrespective of such tests the adequacy of plants must finally be judged by their ability or otherwise to destroy tubercle bacilli, since that is the primary function of pasteurisation. It is of interest to note that Scott and Wright found that out of 332 samples of milk taken from 3 plants run in a slipshod manner,

¹ Medical Research Council, Special Report Series No. 189.

² Hannah Dairy Research Institute, 1935, Bull. No. 6, pp. 72.

3.3 per cent. contained tubercle bacilli. Out of 340 samples taken from 4 efficiently operated plants, none were found to contain this organism.

PHYSIOLOGY FOR SCHOOLBOYS

A SMALL book,¹ to which Sir Humphry Rolleston and Dr. J. R. Rees have written complimentary forewords, embodies a course of seven lectures primarily intended for public schoolboys. The first four lectures deal with the digestive, circulatory, respiratory, and skeletal systems. Consideration of the nervous system is divided between the fourth and fifth lectures and the latter also includes the urogenital system. The sixth lecture summarises what has gone before and the seventh lecture, reserved for those of leaving-age, discusses venereal disease. The facts are accurate and the treatment not too profound. The style is attractively simple and intimate. Dr. Barber perhaps dwells too much on the dangers of constipation and, in a laudable anxiety not to stress sex unduly, has possibly erred on the other side. Some concrete amplification as to how the sex-impulse is to be sublimated before marriage is economically possible might not have been out of place. This little work should be in the hands of all schoolmasters, parents, and school medical officers. With certain modifications, it should be equally useful to headmistresses and those who have charge of the adolescent girl.

A VISIT TO THE G.P.O.

IN no business is efficiency as necessary for the comfort and smooth running of private and business life as it is in the General Post Office. How this high standard is maintained was shown when the Postmaster-General entertained the London University Medical Graduates Society on Feb. 21st in the King George V. Hall of the Central Telegraph Office. After welcoming the guests, he invited them to visit what he claimed to be the largest and most efficient business organisation in the country. To the medical profession, he said, the health service under Dr. H. H. Bashford would be of particular interest, especially on account of the complete and accurate records kept of the staff of over 240,000, of all ages from 16 to 60. The recent great advances in the Post Office routine kept abreast of the times in response to the need of the general public for simplicity and of the modern business world for speed and efficiency. Examples were, on the one hand, the sixpenny telegram and the single night charge for all telephone calls throughout the country; and, on the other, the development of continental and trans-atlantic telephony, the "telex" system where typescript would be transmitted and received in the same way as conversation in the ordinary telephone, and, for the press, picture telegraphy. Mr. W. McAdam Eccles, in expressing the thanks of the company, claimed to be one of the first in Harley-street to use the telephone, and he described its value at that time in a surgical emergency in the country.

The guests were then divided into groups to visit the chief departments of the Post Office. One party was conveyed to Mount Pleasant, the headquarters of the inland sorting office and of the unique underground postal railway. A second group stayed in the Central Telegraph Office, which also housed the medical department and the new air-conditioned King George V. Hall, used for exhibitions, broadcasting, lectures, and cinema displays. The apparatus and transmission of picture and ordinary telegraphy were demonstrated, as well as the use of underground tubes, of which there are 75 miles under the London streets connecting the main post offices and business houses, and of the telephone, both of which have done much to accelerate telegraphy. The two remaining parties were shown the overseas mail

department and the international telephone exchange; telephonic communication took place during the time of the visit with places as far apart as Cape Town, Sydney, Bombay, New York, and the *Aquitania* in mid Atlantic.

A HOME FOR TUBERCULOUS NURSES

Miss K. L. Borne, Matron of Papworth Village Settlement, Cambridge, writes: "Papworth proposes to build a special home for the benefit and prolonged after-care of nurses who have contracted tuberculosis in the course of their duties. This scheme ought to meet with the approval of members of the medical profession who know how difficult it is to advise an ex-sanatorium nurse regarding her future and her means of livelihood. At Papworth work will be available, either as a nurse or in some other suitable occupation. Since 1930 we have found it possible to employ many ex-patient nurses in the wards or in the Papworth Industries. We have discovered that, given shorter hours and sanatorium conditions, under medical supervision, such patients have become partially, some wholly, self-supporting. It is to give a larger number of nurses this same opportunity that I am venturing to ask assistance from the medical profession in the form of a small contribution towards the cost of building this house for 40 ex-sanatorium nurses, or a donation to the Endowment Fund. If every member of the medical profession would send me 5s. we could, I think, pay for the house and still have something over towards endowing a few beds for nurses who are no longer able to work at all, and whose future is grey. The house has been designed by Mr. H. H. Dunn, F.R.I.B.A., our honorary architect, and will be built by the Papworth Industries, thus providing employment for other ex-patients at Papworth. Its site will be near our Nurses' Home, in beautiful surroundings, with a garden, and will contain 40 bedrooms and dining- and sitting-rooms. The cost is expected to be less than £20,000."

PHYSIOLOGY OF LACTATION

THE physiology of milk secretion in the cow is being studied by Prof. H. D. Kay, of the National Institute for Research in Dairying, and his co-workers, and some of the findings were communicated to the Royal Society last Thursday. A new technique has been devised for obtaining arterial blood without serious disturbance to the animal, and with this method it has been ascertained that: (1) the fat of cow's milk is derived mainly from the non-phospholipin fatty acids of the blood; (2) the phosphorus compounds of the milk (including casein) derive their phosphate from the *inorganic* phosphate of the blood plasma; (3) relatively large quantities (up to 30 per cent.) of the blood-sugar are removed from the blood on passage through the mammary gland, the amount of sugar taken out of unit volume of blood being related to the level of sugar in the arterial blood and (probably) to the volume of milk secreted; and (4) the number of volumes of blood required to produce one volume of milk is of the same order whether calculated from the fatty acid changes, inorganic phosphate changes, or sugar changes between arterial and venous blood. A rapid circulation of blood—probably at the rate of 300–400 volumes for each volume of milk secreted—takes place through the mammary tissue.

The suggestion has been made that one of the factors controlling the quantity and quality of the milk secreted is the arterial blood-sugar level. This can be raised and kept above the normal level in the cow by thyroid feeding or thyroxine administration, and under proper conditions, it is found, thyroxine produces a considerable increase in milk volume and in milk fat percentage and also in the percentage of non-fatty solids in the milk. After cessation of thyroxine treatment, the rate of milk secretion rapidly falls and may go below the normal rate that would be expected from the slope of the lactation curve. Thyroxine does not, however, prevent the normal

¹ School Education in Hygiene and Sex. By G. O. Barber, M.B., B.Chir., M.R.C.S., L.R.C.P., Medical Officer, Felsted School. Cambridge: W. Heffer and Sons, Ltd. 1936. Pp. 71. 2s. 6d.

progress of the diminution of functional activity of the mammary gland (which normally takes place after the peak of the lactation cycle): the "thyroxine curve" is parallel with the "normal" one but at a considerably higher level.

During these investigations the phosphatase content of the milk (but not of the blood plasma) of the thyroxine-treated animals showed a striking decrease, which was more than restored when thyroxine administration was stopped. The phosphatase of the milk, it is concluded, is not derived directly from that of the blood.

Messrs. DOWN BROS., LTD. (London, S.E. 1), have been awarded the medal of the exhibition held at Cairo last month in connexion with the tenth International Congress of Surgery. They displayed surgical instruments and theatre equipment.

Vacancies

For further information refer to the advertisement columns

Albert Dock Hospital, Connaught-road, E.—Res. M.O. At rate of £110.
 Aylesbury, Bucks, Mental Hospital, Stone.—Sen. Asst. M.O. £600. Also two Jun. Asst. M.O.'s. Each £350.
 Bath Royal United Hospital.—H.S. At rate of £150.
 Belfast, Royal Maternity Hospital.—Res. H.S. At rate of £100.
 Benenden, Kent, National Sanatorium.—Jun. H.P. At rate of £150.
 Birmingham City.—Asst. M.O. for Maternity and Child Welfare. £500.
 Birmingham, Queen's Hospital.—Res. Surg. Reg. £125. Also Sen. Res. Anaesthetist. £70-£100.
 Brighton, Royal Sussex County Hospital, and Hove General Hospital.—Hon. Physiotherapist. Also Hon. Med. Reg.
 Bristol University.—Asst. Clin. Path. £375.
 Cardiff, Welsh National Memorial Association.—H.P. for Adeline Patti Hospital. At rate of £150.
 Charderton, U.D.—M.O.H., &c. £800.
 Chester, County Mental Hospital.—Jun. Asst. M.O. £350.
 City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—Physician to In-patients.
 Colonial Medical Service.—Twenty-five Vacancies. Each £600-£700.
 Dewsbury and District General Hospital.—Second H.S. £150.
 Dreadnought Hospital, Greenwich, S.E.—H.P. and H.S. Each at rate of £110.
 Dublin, Peamoun Sanatorium, Newcastle.—Asst. Med. Supt. £300.
 Dudley, Guest Hospital.—H.S. £200.
 Dundee Corporation.—P.H. Dept. Asst. M.O.H. £600.
 Edinburgh, National Association for the Prevention of Tuberculosis.—Secretary-General. £600.
 Exeter, Royal Devon and Exeter Hospital.—H.S. to Ear, Nose, and Throat Dept. At rate of £150.
 Gloucestershire Royal Infirmary.—H.S. to Ear, Nose, and Throat Dept. At rate of £150.
 Golden-square Throat, Nose, and Ear Hospital, W.—H.S. £100.
 Gordon Hospital for Rectal Diseases, Vauxhall Bridge-road, S.W.—Res. H.S. At rate of £150.
 Guildford, Royal Surrey County Hospital.—H.S. Also H.P. and Cas. O. Each at rate of £150.
 Hamstead General and N.W. London Hospital, Haverstock Hill, N.W.—Cas. M.O. for Out-patient Dept. At rate of £100.
 Harrogate and District General Hospital.—H.P. and Cas. O. Also H.S. Each at rate of £150.
 Hertford County Hospital.—Hon. Clin. Asst. Hospital for Sick Children, Great Ormond-street, W.C.—Res. H.P. and Res. H.S. Each at rate of £100.
 Hospital for Tropical Diseases, Gordon-street, W.C.—H.P. At rate of £120.
 Hove General Hospital.—Hon. Medical Officer.
 Huddersfield Royal Infirmary.—Cas. O. £200. Also H.S. At rate of £150.
 Kennington Royal Borough.—Asst. M.O. £500.
 Kesteven County Council.—M.O.H. £1000.
 Lancashire County Council.—Asst. Med. Supt. for High Carley Sanatorium. £450. Also Jun. Asst. M.O. for Wrightington Hospital. £200.
 Leamington Spa, Warnford General Hospital.—Res. H.S. to Cas. and Spec. Depts. At rate of £150.
 Leicester Royal Infirmary.—Res. Anaesthetist. At rate of £150.
 Cas. O., H.S., and H.P.'s. Each at rate of £125. Also Jun. Cas. O. At rate of £100.
 Liverpool, City Infectious Diseases Hospitals.—Asst. Res. M.O. £200.
 Liverpool, Hospital for Consumption and Diseases of the Chest, Mount Pleasant.—Res. M.O. £150.
 Liverpool, Ministry of Pensions Hospital, Mossley Hill.—Visiting Surgeon. £300.
 London County Council.—Temp. District M.O. At rate of £290.
 London Homoeopathic Hospital, Great Ormond-street, W.C.—H.P. At rate of £100.
 Macclesfield General Infirmary.—Second H.S. At rate of £150.
 Maidstone, County Pathological Laboratory.—Asst. Pathologist. £700.
 Maidstone, West Kent General Hospital.—H.P. £175.
 Manchester, Crumpsall Hospital and Institution.—Jun. Asst. M.O. At rate of £200.

Manchester Royal Children's Hospital, Garside-street.—Two Asst. M.O.'s. Each at rate of £150.
 Manchester Royal Eye Hospital.—Jun. H.S. £120.
 Manchester Royal Infirmary.—Jun. Asst. M.O. for Radiological Dept. £350.
 Manchester, St. Mary's Hospital.—Four H.S.'s. Each at rate of £50.
 Manchester, Withington Hospital and Institution.—Asst. M.O. for Tuberculosis Wards. At rate of £300.
 Melton, Suffolk, St. Audry's Hospital.—Jun. Asst. M.O. £350.
 Middlesex County Council.—Asst. M.O. £600.
 Northampton General Hospital.—H.P., H.S.'s, also Cas. O. Each at rate of £150.
 Norwich, Norfolk and Norwich Hospital.—Res. Surg. O. £250. Also Res. Orthopaedic O. £200.
 Nottingham General Hospital.—H.S. for Fracture and Orthopaedic Depts. £300. Also H.S. to Ear, Nose, and Throat Dept. At rate of £150.
 Plymouth City General Hospital.—Jun. Asst. M.O. £250.
 Preston, Sharoe Green Hospital.—Sen. and Jun. Asst. Res. M.O.'s. At rate of £200 and £100 respectively.
 Prince of Wales's General Hospital, N.—Hon. Med. and Surg. Regs. Each £100.
 Princess Elizabeth of York Hospital for Children, Shadwell, E.—H.P. At rate of £125.
 Princess Louise Kensington Hospital for Children, St. Quintin-avenue, W.—H.S. At rate of £100.
 Reading County Borough.—Asst. M.O.H. and Asst. School M.O. £500.
 Rochdale, Birch Hill Hospital.—Jun. Res. M.O. At rate of £200.
 Rochdale Infirmary and Dispensary.—Second H.S. £150.
 Romford Isolation Hospital.—Res. Asst. M.O. £350.
 Rotherham Hospital.—Cas. H.S. £150.
 Royal Eye Hospital, St. George's-circus, S.E.—Part-time Pathologist and part-time Bacteriologist. Each £100. Also Sen. H.S. and two Asst. H.S.'s. At rate of £150 and £100 respectively.
 Royal Masonic Hospital, Ravenscourt Park, W.—Res. Surg. O. At rate of £250.
 Royal National Orthopaedic Hospital, 234, Great Portland-street, W.—H.S. At rate of £150.
 St. John's Hospital, Lewisham, S.E.—Hon. Anaesthetist to Ear, Nose, and Throat Dept.
 St. Peter's Hospital for Stone, &c., Henrietta-street, W.C.—H.S. At rate of £75.
 Salford Royal Hospital.—H.P., H.S., and Cas. H.S. Each at rate of £125. Also Hon. Asst. Gynecologist.
 Scarborough Hospital and Dispensary.—Two H.S.'s. Each £175.
 Sheffield, Jessop Hospital for Women.—Res. M.O. Also two H.S.'s. At rate of £150 and £100 respectively.
 Shoreham-by-Sea, Southlands Hospital.—Part-time Radiologist. £100.
 South Shields, Ingham Infirmary.—Jun. H.S. £150.
 Stoke-on-Trent, North Staffordshire Royal Infirmary.—Radium Officer. £500.
 Sunderland Royal Infirmary.—H.S. £120.
 Tancred's Studentships.—Three. Each £100.
 Warrington Infirmary and Dispensary.—Third Resident. At rate of £150.
 West London Hospital, Hammersmith-road, W.—H.P. and H.S. to Spec. Depts. Also Res. Cas. O. Each at rate of £100.
 Non. Res. Cas. O. £250.
 Wolverhampton, Royal Hospital.—H.S. for Orthopaedic and Fracture Dept. At rate of £100.
 Woodside Hospital, Muswell Hill, N.—Sen. Asst. Phys. £600.
 The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Broughton, Hants.

Births, Marriages, and Deaths

BIRTHS

BACH.—On Feb. 18th, 1936, at 20, Devonshire-place, W.1, to Matine (née Thompson), wife of Francis Bach, M.D., of 49, Wimpole-street, W.1—a son.
 CHAMBERS.—On Feb. 16th, at Ealing Common, W., the wife of Dr. J. R. Chambers, of a daughter.
 MOCKLER.—On Feb. 18th, at Welbeck-street, W., the wife of Surg. Lt.-Comdr. E. J. Mockler, M.B. N.U.I., Royal Navy, of a son.

MARRIAGES

ENRAGHT—SHEPHERD.—On Feb. 20th, William Enraght, M.R.C.S. Eng., Croydon-road, S.E., to Jessie Gray, youngest daughter of the late Mr. and Mrs. T. A. Shepherd.
 REECE—PETRIE.—On Feb. 15th, at St. James's, Piccadilly, Richard Harold Reece, M.A. Camb., M.R.C.S., to Janet Anderson Petrie, B.Sc., only daughter of Mr. and Mrs. John A. Petrie of Glasgow.

DEATHS

DUNLOP.—On Feb. 19th, at Norbrook, Knock, Co. Down, Joseph Everard Dunlop, M.D. R.U.I.
 PRUEN.—On Feb. 19th, Septimus Tristram Pruen, M.D. Durh., of Cheltenham, aged 76.
 UNDERHILL.—On Feb. 17th, at Vancouver, Frederic Theodore Underhill, F.R.C.S. Edin., son of the late Dr. William Lees Underhill, Tipton, Staffordshire.
 WILSON.—On Feb. 19th, James Alexander Wilson, O.B.E., M.D. Glasg., of Cambuslang, Lanarkshire.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

ADDRESSES AND ORIGINAL ARTICLES

SOME OBSERVATIONS ON
PEPTIC ULCER*

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LONDON

PEPTIC ulcer is in some respects a modern disorder, for it is unknown in the primitive uncivilised races, and equally unknown in the animal kingdom. It attacks the young adult rather than the old, the thin rather than the fat, and males more frequently than females. It is a common source of ill-health in city dwellers, and more often in those who carry responsibilities and their attendant anxieties. Moreover, there is a constitutional type which is prone to develop the disorder, the doer rather than the dreamer, the active in body and mind rather than the lethargic and more contented. It is not surprising, therefore, that its incidence is on the increase. The Registrar-General's statistics show that the number of deaths from ulcer has risen steadily during the past ten years (Table I.), and since the mortality is relatively low, we can assume that the number actually suffering from the disorder is also steadily rising.

TABLE I

Deaths due to Peptic Ulcer in England and Wales (1921-31)

—	1921.	1923.	1925.	1927.	1929.	1931.
Males ..	1693	2106	2454	2973	3053	3214
Females ..	963	906	998	997	1028	1021
Total ..	2656	3012	3452	3970	4081	4235

Experimental and Pathological Data

Before proceeding to the more clinical aspect of this problem, brief reference should be made to work which has been done on animals. For many years attempts to produce a "chronic" ulcer met with no success, but during recent years this has been accomplished, largely through the work of American experimental surgeons, notably Mann,¹ Ivy,² Matthews and Dragstedt,³ and Morton.⁴ Mann and Williamson⁵ were the first to develop a technique of diverting the alkaline duodenal juices and demonstrate that an ulcer would form in the intestine distal to the anastomosis, although it appears that Exalto⁶ in 1911 was the pioneer.

If the intestine is anastomosed to the stomach, and the duodenum with its alkaline juices allowed to drain into the lower part of the intestine, an ulcer readily forms at the site where the gastric juice first impinges on the intestinal mucosa. It develops with great rapidity, for according to Mann and Bollman⁷ penetration of the mucosa only needs a few hours and perforation into the abdominal cavity can occur within the first 48 hours. The typical "chronic" ulcer forms within 3-4 weeks, and histologically this is identical with that seen in man. Furthermore, its presence, like that of the human ulcer, is heralded by such events as perforation or melæna.

Not only does this experimental ulcer form readily, but it equally readily disappears. Provided the acid juice is made to impinge on an adjoining part of the

intestinal mucosa, the original ulcer begins to heal, and within 30 days healing is often complete. Mann draws attention to the delicacy of the repair tissue, and the ease with which it can be broken down again by coarse food or an acid juice. The mucosa readily regenerates, but if the muscle has been involved in the ulcerative process it is replaced by scar tissue only.

Matthews and Dragstedt's technique³ is particularly instructive in demonstrating the essential action of the gastric juice (Fig. 1). By suturing the jejunum or ileum on to a

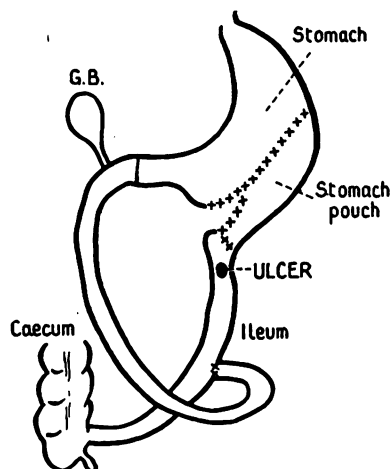


FIG. 1.—Matthews and Dragstedt's experiment.
G.B. = gall-bladder.

gastric pouch, and thereby allowing the intestinal mucosa to be bathed with a highly concentrated acid juice, ulcers could be produced with regularity—"a striking example of the susceptibility of an organism's living tissues to the irritant action of its own pure active gastric juice." It was also demonstrated by these workers that if the gastric juice was deliberately retained in this pouch by plugging the stoma, an ulcer formed in the pouch itself. The implantation of a portion of intestinal wall into the stomach does not result in ulcer formation (Dragstedt and Vaughan⁸), but if a small gastric pouch is implanted into the intestine, ulcer formation is the rule. In the latter experiment the intestinal mucosa is exposed to the pure active juice undiluted with food, while in the former experiment the gastric juice is already diluted and buffered by food and saliva and its action weakened in consequence.

These experiments prove that under certain conditions normal gastric juice is by itself capable of producing a chronic ulcer in the intestine. The commonest seat of ulcer in man is the first part of the duodenum, and here, as Mann and Bollman state, "is the site where the onrushes of acidity produced in the fundus are met, diluted, neutralised and buffered for acceptance by the intestine." Under normal conditions the acidity of the duodenal contents fluctuates between a pH of 2 and 7, but the jejunal contents maintain a steadier reaction between a pH of 6.2 and 8.2 (Wu, quoted by Mann and Bollman⁹). When the jejunum is anastomosed to the stomach the jejunal contents are then found to fluctuate between a reaction of pH 1.7 and 8.33, under which condition we know that jejunal ulceration would be possible. Corroborative evidence of the importance of acid in ulcer development is the observation, again made by Mann, that repeated administration of acid does eventually result in an ulcer of the stomach itself.

Methods to produce partial pyloric stenosis have been shown to result in increased acidity,^{10 11} and Bolton¹² in 1909 demonstrated the slow healing of traumatic ulcers under such conditions. Not only

* The Bradshaw lecture for 1935, delivered before the Royal College of Physicians of London on Nov. 5th.
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does the acidity rise in partial pyloric stenosis, experimentally produced, but the spontaneous perforation of a duodenal ulcer has been recorded as a sequel to this (Elman and Eckert¹³; Ham-

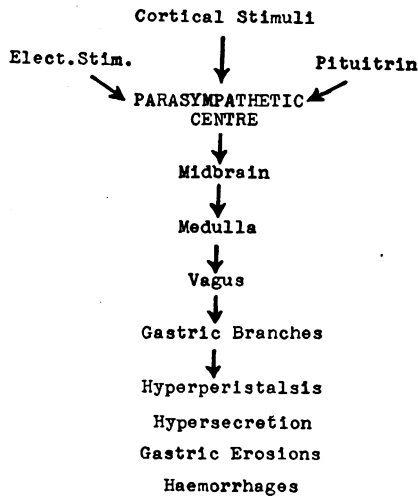


FIG. 2.—Diagrammatic representation of nervous pathways (after Cushing).

From these observations we are quite justified in concluding that the experimentally produced chronic peptic ulcer is dependent on an acid gastric juice for its development, and that an acid juice, provided it is undiluted, is sufficient for the development of the ulcer in the intestine. When we recall that the commonest seat of ulcer is in the duodenum, this knowledge derived from animal experiments becomes highly significant. We also learn that the ulcer forms with rapidity and likewise is rapid in healing. Whatever view is held regarding the aetiology of ulcer in man, due cognizance must be given to this eroding action of the gastric juice. Is it possible that clinical ulcers as readily heal and break down again? The coexistence of achlorhydria and ulcer would certainly be difficult to explain, and any treat-



FIG. 4.—Large ulcer crater in a man of 64 with an eight weeks' history.

ment which does not allow for adequate neutralisation of the acid juice would not enjoy experimental support.

THE NERVOUS FACTOR

Some three years ago Harvey Cushing,¹⁵ in a masterly article, referred to the influence of the nervous system on gastric function. Much that was valuable was resuscitated and further experimental work initiated.

That gastric changes can be caused by nervous lesions was first pointed out by Rokitsansky¹⁶ in 1846, and from then onwards isolated observations of organic brain lesions associated with gastric hæmorrhage and ulceration have been recorded. In 1875 Brown-Séquard¹⁷ showed that injury to the base of the brain produced gastric erosions. The association of subtentorial hæmorrhage and brain injury at birth with gastric hæmorrhage was also noted and commented upon. Cushing's interest in the subject was aroused by the death of three patients from perforated ulcer after operation for a brain tumour. Some time before this Beattie¹⁸ had shown that electrical stimulation of the nuclei in the region of the third ventricle leads to increased gastric peristalsis and hypersecretion; with continued stimulation gastric erosions could be produced. Severance of the vagi abolishes these effects, and identical effects are produced by direct stimulation of the vagus (McCrea, McSwiney, and Stopford,¹⁹ 1927; Beattie and Sheehan,²⁰ 1934).

Stimulation of the brain-stem in any part, from this centre in the region of the third ventricle down along the vagal tracts to the vagal nucleus, will produce the same motor and secretory changes in the stomach (Fig. 2). Cushing recalls that this centre is in the vicinity of Cannon's seat of the emotions, and it must of course be influenced by higher centres. Is this pathway unduly stimulated under certain circumstances? For example, do emotional upsets result in hypersecretion and hyperperistalsis in the man who complains of epigastric discomfort under tension, and who ultimately develops an ulcer? Can we show in our clinical experience any such relationship between the nervous system and the production of a peptic ulcer? Is the onset of symptoms, either initially or in recurrences, related to some primary disturbance first experienced in the nervous system? If the nervous system plays a primary part in initiating symptoms, we should meet with such a group of symptoms before the development of the ulcer, and there should be a high incidence of emotional upsets in recurrences.

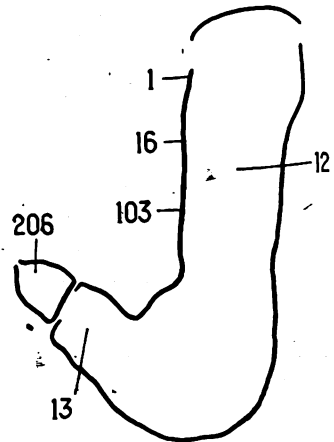


FIG. 3.—Diagram of stomach showing location of ulcers in author's series.

Scope of Present Inquiry

In this lecture I shall try to show that clinical experience is in many respects in accord with the experimental and pathological findings I have outlined. Do not clinical "ulcers" form readily and heal readily, and is there not good evidence to confirm the essential action of an acid gastric juice? Moreover, is there not an "ulcer" type in which symptoms frequently follow an emotional upset, and in which relaxation brings relief not only to the mind but also to gastric function?

During the last five years I have personally observed and followed 377 patients showing a "chronic" ulcer. They have been seen frequently, and periodic

radiological examination has been carried out. The gastric secretion has also been repeatedly studied in a large number. The material is set out in Table II.:

TABLE II
Cases under Review

		Male.		Female.	
Gastric ulcers	145	75	70		
Duodenal ulcers	206	137	69		
Gastro and duodenal ulcers.. ..	11	6	5		
Post-operative ulcers..	15	14	1		
	377	232	145		

The proportion of females is somewhat high, and this is in all probability due to the preponderance of female patients at the Royal Free Hospital.

The Site of Ulceration

It is well established that the seat of the ordinary peptic ulcer is either in the first part of the duodenum or on the lesser curve of the stomach; it is seldom found in other parts of the stomach. In my series, as can be seen from Fig. 3, only 12 (3.4 per cent.) were on the posterior wall, and 13 (3.5 per cent.) in the prepyloric area. Of the 145 gastric ulcers 120 were on the lesser curve, and only 16 of these in the upper third; the middle third claiming 103. Only 1 was situated at the cardia. Those in the first part of the duodenum or on the lesser

curve of the stomach amounted to 94 per cent. This distribution is important—as Hurst²¹ has emphasised; and as Holmes and Hampton²² have recently pointed

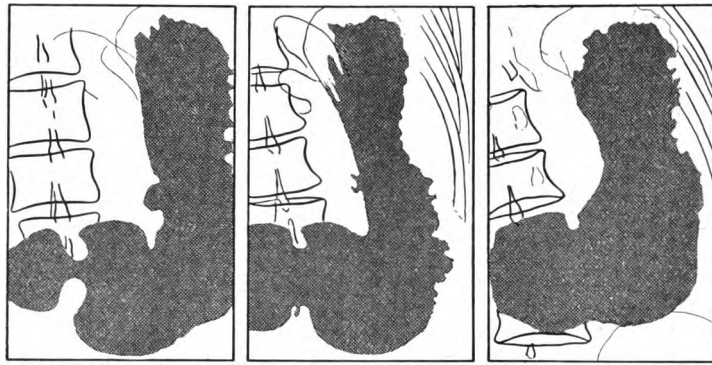


FIG. 5.—A lesser-curve ulcer in a male aged 30. The second film shows the healing process a week later, with the disappearance of the crater at the end of a month in the third film. Ambulatory treatment.

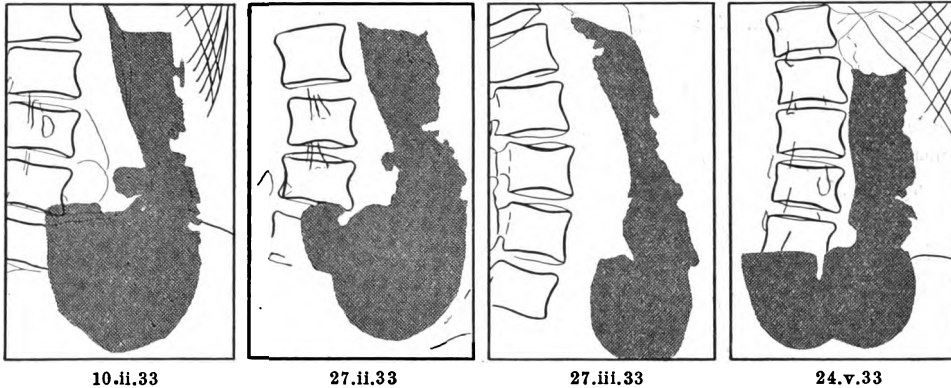


FIG. 6.—A large lesser-curve ulcer in a woman of 42, who also showed an anæmia (Hb 40 per cent). Considerable diminution in size of crater is seen in 2½ weeks, and no trace of abnormality could be demonstrated in 6 weeks. Note the improvement in gastric tone observed in the final film (3 months).

out—in the differentiation between ulcer and cancer. Carcinoma of the stomach is usually a pyloric lesion, whereas only about 3 per cent. of benign ulcers are in the prepyloric area. It is well, therefore, to treat these prepyloric lesions as potential cancer, and, as Hurst maintains, operation on them is the wiser plan.

Rapidity of Formation of Ulcer

While histories of dyspepsia for ten years or more are common, some patients give only a history of a few weeks but nevertheless show a well-defined crater. The size of the ulcer crater is certainly not proportionate to the length of dyspepsia. Occasionally one has a chance of gauging the time of appearance of an ulcer, as in one of my patients, a man of 64, who had had dyspepsia for four weeks. A barium meal examination disclosed no ulcer crater; nor was anything abnormal seen at a second examination at the fifth week. At the eighth week, however, a large crater was plainly demonstrable (Fig. 4). In another case a large crater on the lesser curve was found in a man of 68 with only three weeks' dyspepsia.

Table III. shows the duration of symptoms in my series.

It will be seen that as many as 76 (23 per cent.) gave histories of less than three months' duration, and it is unlikely that in all these persons the ulcer

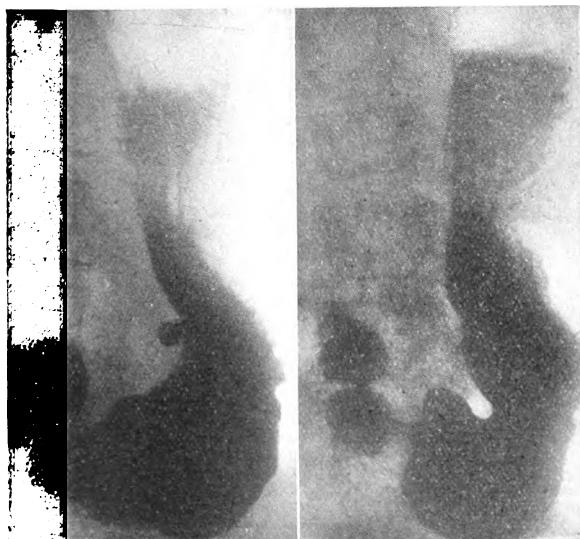


FIG. 7.—Ulcer of lesser curve in a woman aged 50, with complete disappearance in five weeks. Ambulatory treatment.



FIG. 8.—A large lesser-curve ulcer in a woman aged 49, showing restitution to normal in 13 weeks. Ambulatory treatment.

crater preceded the symptoms. Remissions extend over a number of years, and the patient may enjoy freedom even without treatment for a considerable period. Unfortunately little is known of the radio-

TABLE III
Duration of Symptoms

—	Under 3 mths.	12 mths.	2 yrs.	4 yrs.	6 yrs.	6 yrs. +
Gastric ulcer	44	24	20	11	19	23
Duodenal ..	32	38	26	31	24	55
Total ..	76	62	46	42	43	78

logical state in spontaneous remissions, but it is possible that a large number of ulcers do heal only to break down again in a recurrence.

Much interest is being shown towards cases in which the patient has the symptoms of peptic ulcer, relieved by taking alkalis, yet no ulcer can be found. During the past five years I have collected 8 cases of this kind, in which barium meal examination was repeatedly negative over 2-4 years, but in which an ulcer crater eventually developed. While it would be true to say that these persons had suffered dyspepsia for a long period, the development of an actual ulcer was much more recent. For example, one of them, a woman of 33, had suffered periodic dyspepsia for ten years, and barium meals in 1931, 1932, and 1933 had disclosed no gastric or duodenal lesion; yet in 1935 a lesser curve ulcer became apparent.

The length of symptoms is therefore not necessarily an index of the chronicity of an ulcer. It may be that the actual ulcer crater develops in man more rapidly than we have been led to believe, and that it is not correct to regard the patient who has suffered from dyspepsia for ten years as having had an ulcer of the same duration. Is it not possible that the ulcer comes and goes, heals and breaks down again, instead of being a "chronic" indolent lesion persisting for years?

The Healing of the Ulcer Crater

From time to time much criticism has been levelled against the radiological interpretation of healing of the ulcer crater. It has been suggested that the size of the crater as seen radiographically is largely the result of surrounding oedema, and that medical measures merely dispel the swelling. There is some truth in this criticism; but on the other hand, a lesser curve ulcer can be fairly sharply outlined,

and its diminution in size followed at frequent intervals without any difficulty until it disappears. Nicholas and Moncrieff showed the disappearance of the crater under treatment.²³ Symptoms are dispelled within a few days of adequate treatment, but I have been equally impressed with the rapidity with which repair proceeds and the crater diminishes in size. Considerable improvement is seen in 10-14 days, and in some favourable cases all trace of abnormality has disappeared in 28 days.

Of my lesser-curve ulcer patients 95 were followed sufficiently regularly to provide some information as to the time of ulcer disappearance (Table IV).

TABLE IV

Time of Disappearance of Ulcer Crater (Lesser Curve)

Weeks	3	4	6	8	12	16	24
	10	..	16	..	10	..	23
					23	..	6
							7

It can be seen that 82 were clear in three months and 59 in two months, and these figures gain significance from the fact that only a small minority—

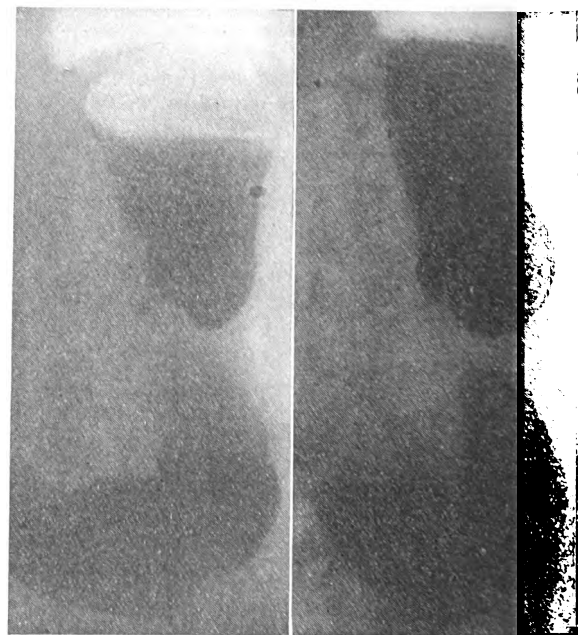


FIG. 9.—Ulcer of lesser curve, with an hour-glass stomach, in a woman of 55. Disappearance of ulcer crater in two months but persistence of the hour-glass deformity. Ambulatory treatment

18—received hospital treatment, the bulk being treated while still at their work. Individual examples of this rapid healing can be seen in Figs. 5-8. In addition to the disappearance of the crater, the gastric tone improves and the shape of the stomach becomes more normal.

A mechanical abnormality, in the form of an hour-glass stomach, is not a bar to the temporary healing of the crater, although such a mechanical defect should be corrected by surgical means without delay, even if it does not give rise to symptoms, for the ground is prepared for further ulceration and recurrences are likely (Fig. 9).

I am unable to demonstrate such significant changes in duodenal ulcer, for some deformity of the cap usually persists in all but the very small craters. There is, however, an obvious improvement in the films which initially show gastric delay and retention. An improvement in tone is observed, and this improvement may persist for years; the delay in emptying is corrected and the signs of early "pyloric stenosis" disappear. Indeed, the response to treatment is often astonishing as is illustrated by the following case:—

A woman of 68 showed the radiographic appearances of early pyloric stenosis in 1932, in that there was gastric delay, a dilated stomach, and a duodenal deformity. Her weight was 8 st. I had intended, after a preliminary course of lavage and medical treatment, to advise a gastro-enterostomy, but her improvement was maintained, and it has so far been unnecessary to consider operation. The radiogram taken in 1935, three years later, shows a better tone, and the stomach now empties in normal time. Her weight has also increased from 8 st. to 11 st. 2 lb.

It behoves us, therefore, to distinguish between actual obstruction and retention; and although radiography is a sure guide in advanced cases, a preliminary course of medical treatment is necessary to distinguish cases in which there is more gastric retention than actual obstruction from those in which surgery is essential for relief. This has been well brought out by Emery and Monroe.²⁴

The only absolute proof of complete healing is that obtained by actual inspection of the stomach at operation, and this is rarely possible. The following details are instructive.



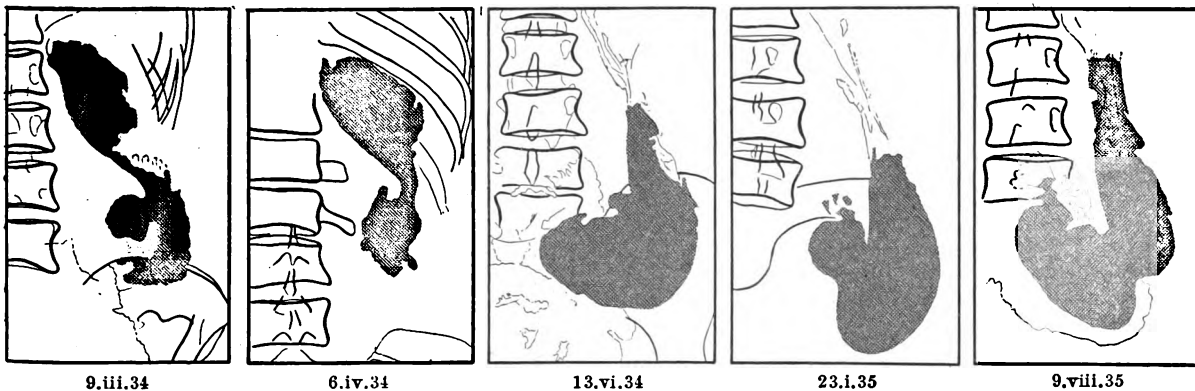
(A) 12.iv.33 (B) 2.vi.33 (C) 8.i.34

FIG. 10.—An ulcer crater on the lesser curve in a man aged 45. The first diagram does not indicate the real size of the crater, for its upper part was occupied by a large gas bubble. The second film shows a lessening in size of the crater in the sixth week. An acute appendicitis developed 8 weeks later, but no gastric lesion could be traced by the surgeon. The third film shows a return of the crater in 10 months' time. Ambulatory treatment.

A man of 48 gave a history of six weeks' dyspepsia. On one occasion five years previously he had suffered from indigestion, but he had remained well in the interval. An ulcer crater was demonstrated on the lesser curve of the stomach (Fig. 10 A). A second examination after six weeks showed much diminution in the size of the ulcer crater (Fig. 10 B), but no further proof of his response was available until eight weeks later when he was suddenly seized with severe abdominal pain and admitted to another hospital as an abdominal emergency. A diagnosis of a perforated ulcer was most probable, but to the surgeon's surprise no lesion could be found in the stomach, and the cause of the emergency proved to be an acutely inflamed appendix. Such evidence of healing is seldom obtainable. It must be added that he lapsed from treatment and returned to me in ten months with a recurrence of his symptoms and the ulcer crater (Fig. 10 C).

Anxiety and tension seem to delay the healing process, and complete rest in bed is occasionally required before symptoms can be dispelled and before any impression can be made on the size of the crater. If there is mental unrest the use of sedatives to produce relaxation is desirable.

One of my female patients showed considerable tension and nervousness, and the healing of the large crater was not realised until treatment had lasted ten months. The history was five weeks, but much weight had been lost and the general condition was very poor. No demonstrable change in the size of the crater followed upon a month's treatment, but some diminution was apparent in three months and again five months, although ten



9.iii.34 6.iv.34 13.vi.34 23.i.35 9.viii.35

FIG. 11.—A huge crater arising from the lesser curve in a woman aged 62, who showed considerable emaciation (5 st. 9 lb.), but gave a history of only 5 weeks. The second film (taken prone) shows no improvement after a month's treatment, but at the end of 3 months the crater is considerably smaller. The last film, 18 months from the commencement of treatment, shows a normal state. Gain in weight from 5 st. 9 lb. to 8 st. 6 lb.

months elapsed before the crater actually disappeared (Fig. 11). After two years there is no recurrence; the patient is symptom-free and her weight has increased from 5 st. 9 lb. to 8 st. 6 lb.

In spite of the utmost attention the ulcer crater occasionally persists, and I have records of six lesser-curve lesions which did not respond to treatment. In one of these cases two admissions to a medical ward failed to dispel the crater and surgery was required. The details of this group are given in Table V.

TABLE V
Persistence of Ulcer Crater

Case and sex.	Age.	Duration of symptoms.	Remarks.
1. M.	50	15 years.	Active ulcer at operation.
2. F.	34	1 year.	Fatal hæmatemesis, sixth month.
3. F.	34	3 years.	Active ulcer; mid-gastric fibrosis.
4. F.	40	2 "	Sixth month, active ulcer.
5. F.	54	1 month.	Large crater sixth month; brain tumour.
6. F.	56	2 years.	Active ulcer at operation.

Position of Ulcer.—Lesser curve in each case.

In the second case hæmorrhage occurred in the sixth month and proved fatal. If a crater shows no sign of healing within three months surgical interference should be advised, and my failure to act on this principle undoubtedly resulted in this tragedy. No apparent explanation is available for the lack of response in the other patients, except No. 5.

The patient was a female, aged 54, who had had hæmatemesis after some mild indigestion. After six weeks a barium meal showed a lesser-curve ulcer, which was still present in twelve weeks' time. This was regarded as unusual, and exhortation for more thorough treatment was made. Further radiography in the sixth month showed a crater larger than on the two previous occasions. At this time the patient complained for the first time of giddiness and weakness in the right upper limb. The weakness of the arm progressed and the signs of a tumour compressing the upper cervical cord advanced rapidly. An attempt to locate and remove this tumour was unsuccessful, and a tumour arising from the bulb was seen producing a pressure cone compressing the bulb and upper cervical cord. The nature of the tumour is uncertain, for it was degenerate when an autopsy was performed. The stomach was the seat of multiple erosions as well as a large ulcer crater which first caused symptoms. While I cannot definitely state that the two lesions had any bearing upon one another, it is possible that the tumour did irritate the vagal nuclei in the medulla and that this repeated stimulation resulted in gastric erosions and hæmorrhage and a chronic ulcer which resisted treatment.

With the exception of these six cases we find undoubted radiological evidence of healing in more than 100 lesser-curve ulcers. This response to treatment occurred while the majority of the patients remained at their work, a fact which further supports the statement that ulcers heal readily. On the other hand, a crater which persists in spite of medical attention should certainly be looked upon with suspicion, and if at the end of three months it is still seen with X rays, operation should be considered.

So far, then, we have found nothing at variance with the experimental observations, and we can safely conclude that the vast majority of ulcers readily heal on medical measures.

(To be concluded)

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FURTHER OBSERVATIONS ON THE RÔLE OF THE TOXIN IN STAPHYLOCOCCAL INFECTION

By F. C. O. VALENTINE, M.B. Camb., M.R.C.P. Lond.
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LONDON HOSPITAL

In a previous paper¹ on staphylococcal toxin evidence was brought forward showing that certain strains of cocci are capable of producing a true leucocidin which destroys the phagocytes of human and rabbit blood and which is distinct from the hæmolyzing and necrosing factor also present in the toxin.

The Medical Research Council recently promoted an inquiry, to which a contribution was made at the London Hospital, into the value of toxoid injections in the treatment of staphylococcal infection. This supplied an excellent opportunity for continuing the work on leucocidin and its significance. The present paper describes methods of making toxin and of estimating the leucocidin in toxin and the antileucocidin in serum, and provides fresh evidence indicating that α -hæmolysin and leucocidin are distinct entities. Finally the methods described are employed in connexion with human material in an attempt to determine the rôles of the two toxins in human disease, attention being chiefly concentrated on the leucocidin.

The Investigation

PREPARATION OF TOXIN

The medium employed has been soft meat—infusion agar at pH 7.6, containing 0.5 per cent. agar.

Medicine bottles make convenient vessels for the purpose; if they are filled about one-quarter full no medium escapes when they are laid flat on their sides, in which position the agar is allowed to set. They are then inoculated by a Pasteur pipette from a fresh broth culture, excess of fluid after spreading being removed as much as possible. The bottles, still horizontal, are placed

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in a desiccator from which the air is exhausted on the water-pump until the manometer reads about 600 mm. when it is replaced by a mixture containing 80 per cent. O₂ and 20 per cent. CO₂. The vessel is then incubated for 24 hours only.

Next morning the bottles are removed and are placed upright which causes the agar to fall to the bottom. A little shaking breaks it up so that it can be poured into filter paper in a Buchner funnel where it is sucked dry on the water-pump. At this point it is advisable to test the reaction of the filtrate and if it is inclined to be alkaline acidify until the colour with phenolsulphonephthalein is orange (about pH 7). The filtrate is then passed through a Berkefeld candle to sterilise it; a Seitz filter may be used but seldom removes all the cocci at the first filtration and a second filtration removes much of the leucocidin.

It has seemed to be important to use a medium with enough agar to present a reasonably firm surface for inoculation, but for the purpose of filtration through paper the softer the agar is the better. The optimum strength is about 0.5 per cent. agar and shaking should be avoided until after incubation.

The method of preparation used seems to permit the production of abundant leucocidin and of a fair but certainly not maximal hæmolysis. In the course of the present work it has been found that leucocidin is less stable than α -hæmolysin, the titre diminishing fairly rapidly, especially in the presence of free oxygen. But for the purpose of serum-toxin titrations it has been found desirable to use a comparatively large test dose of toxin, and in these circumstances toxins can be used for two or three months if kept sealed in a refrigerator.

Recently, however, I have found that filtration, whether through Seitz or candle filter, removes a variable quantity of the toxin. This effect, as might be expected, is greatest when the original concentration of toxin is low, and may be almost negligible with a strong toxin. It may therefore happen that a preparation which was originally strongly hæmolytic but feebly leucocidal may be found after filtration to be still strongly hæmolytic but without any demonstrable leucocidin.

The staphylococcal strains which have been used for the production of toxin were originally maintained in the refrigerator in blood broth, but it was found that this method was unsatisfactory for preserving their toxigenicity. Latterly Worth's medium has been used with better results, but there is still evidence of a gradual diminution in toxigenic power particularly affecting leucocidin production.

TESTING SERUM AND TOXIN

1. *Hæmolysin*.—It has now been established by Glenny and Stevens² following the work of Bigger, Boland, and O'Meara,³ and Bigger,⁴ that staphylococcal toxin may contain two separate hæmolytic factors, α and β . Since there is no evidence indicating that the β -toxin is of importance in human infection, the α -toxin only has been taken into account in the present work; and it has been assumed that the ability of the α -toxin to lyse rabbit red cells, to cause necrosis of living tissue, and to kill rabbits on intravenous injection is due to the presence of one factor which may be designated and estimated as α -hæmolysin.

The anti-hæmolysin content of all human and other sera tested in the course of the present work was estimated against the standard toxin B.8750 supplied by the Wellcome Laboratories, and this in its turn was always controlled against their K-serum B.8760, which is stated to contain per c.cm. 150 international units of anti-hæmolysin. In this paper all figures for anti-hæmolysin are given in terms of the international unit.

The hæmolytic activity of toxins has been estimated against K-serum and will be expressed as the L.H. dose—i.e., the smallest volume of toxin still hæmolytic for 1 per cent. rabbit cells after mixing with 1 unit of antitoxin.

2. *Leucocidin*.—No unit of antileucocidin has as yet been established nor is the existence of a specific leucocidin universally recognised. It is necessary therefore to describe how leucocidin and antileucocidin may be demonstrated and estimated.

For this purpose the washed cells of human blood have been used as a routine, the blood being first taken into 2 per cent. citrate in normal saline. It is advisable to reserve a few cubic centimetres of blood in a dry tube so that a supply of homologous serum is available.

For the test small tubes of 8 or 9 mm. internal diameter have been used. In serum-toxin titrations each tube receives 0.1 c.cm. toxin dilution and 0.1 c.cm. serum dilution, one of which is standard. These are mixed and allowed to stand for 5–15 minutes at room temperature. 0.1 c.cm. of washed concentrated cells is added and the tube again shaken and incubated for one hour. 0.1 c.cm. of homologous serum may then be added; this improves the quality of films made from the mixture and also prevents any further action of the toxin. The tubes are then re-shaken and a film is spread from each by platinum-loop, a method which has been found to cause less damage to the cells than spreading with another slide. Films are finally stained with Leishman. For estimating the titre of leucocidin in the absence of antibody the latter is replaced by saline.

After a little experience of the method the films are best examined under the $\frac{3}{8}$ in. objective with a $\times 10$ or $\times 14$ eyepiece. The "bird's-eye" view thus obtained is invaluable for comparing different films while individual cells can be checked with the high power. The titre of a toxin is indicated by the highest dilution from which the Leishman film shows no recognisable polymorphonuclear neutrophils. The titre of a serum is given by the highest dilution in which recognisable neutrophils persist. The latter titration is therefore open to the objection that for the demonstration of the end-point a sufficient excess of toxin must remain to destroy all the phagocytes which are present. But it has been found that even in "normal" human serum the amount of antileucocidin is sufficiently large and variable to permit the use of a very large test dose of toxin, roughly 16 times the amount of fresh toxin needed to destroy the same number of leucocytes in the absence of all antitoxin. In these circumstances titrations with 100 per cent. differences are sufficiently accurate and give a clear end-point.

For the titration of immune horse-serum greater accuracy is desirable and can be obtained. It is then important that the toxin should be quite fresh so that a small excess may be demonstrable. It is also practicable to double the volumes of serum and toxin dilutions in each tube (to 0.2 c.cm. of each) while leaving the volume of cells at 0.1 c.cm. In this way successful titrations with 25 per cent. differences have been made.

It happened that for the first tests made on human serum in the course of the present work, a batch of toxin was used which was neutralised by its own volume of K-serum diluted 1 in 100 but not by 1 in 200. It was also found that the smallest amount of antileucocidin commonly present in normal human serum was equivalent to K-serum 1 in 100. This amount is therefore suggested as a useful antileucocidin unit, although in this paper all figures are given in terms of K-serum.

Toxins are standardised by finding the lowest dilution which is inactive after mixing with an equal volume of K-serum diluted 1 in 100. Since 100 per cent. differences have been employed in all titrations throughout the present work, it has been sufficient to find the highest dilution of a toxin which is still active after mixing with an equal volume of K-serum diluted 1 in 200. The toxin could then

be used in this dilution for the titration of unknown serum, being always controlled against K-serum in the critical dilutions of 1 in 100 and 1 in 200. For more accurate estimations smaller differences are necessary and, as has been indicated above, can be used.

The antileucocidin here discussed appears as a true antibody to be found in the serum of horses and rabbits following the injection of leucocidal toxin. It also occurs in the serum of patients in the course of staphylococcal infection. Tests which have been made on horse serum indicate that the antileucocidin content may be concentrated in the pseudoglobulin fraction with the antihæmolysin.

THE LACK OF RELATIONSHIP BETWEEN α -HÆMOLYSIN AND LEUCOCIDIN AND BETWEEN THEIR ANTIBODIES

The experiment shown in Table I. compares the activity of two filtrates and shows that the ability of a staphylococcal strain to produce α -hæmolysin is unrelated to its ability to produce leucocidin. One

TABLE I

Filtrate.	Saline or serum.	Filtrate dilutions.									
		1/1	1/2	1/4	1/8	1/16	1/32	1/64	1/128	1/256	1/512
W.46	Nil.	H.	H.	H.	H.	H.	..	H.	H.	H.	H.
..	K/200	H.	H.	H.	H.	H.	..	H.	H.	H.	H.
..	Saline.	L.	L.	L.	L.	L.	..	L.	L.	L.	L.
..	K/200	L.	L.	L.	L.	L.	..	L.	L.	L.	L.
C.	Nil.	H.	H.	H.	H.	H.	H.	H.	H.	H.	H.
..	K/200	H.	H.	H.	H.	H.	H.	H.	H.	H.	H.
..	Saline.	..	..	..	..	..	..	..	..	..	..
..	K/200	..	..	..	L.	L.	L.	L.	L.	L.	L.

W.46 = Wood 46.
 H + complete hæmolysis of 1 per cent. rabbit cells.
 L + = complete destruction of human neutrophils.

of these toxins was produced by the well-known strain Wood 46, and the other, toxin C, by a coccus isolated from a large carbuncle.

If filtrate Wood 46 contains 16 times the amount of hæmolysin present in filtrate C, and the latter contains at least 250 times the leucocidin present in Wood 46, it would seem that α -hæmolysin and leucocidin must be distinct.

That antihæmolysin and antileucocidin also vary independently of each other is illustrated by the example of a horse immunised at the Lister Institute by Dr. McClean. This horse had previously been immunised against α -hæmolysin and its serum, at the beginning of the experiment here described, contained approximately 150 units antihæmolysin and 0.5 K antileucocidin. After immunisation with a toxin prepared in this laboratory, containing a moderate α -hæmolysin and fairly strong leucocidin, the serum titres were approximately 100 units antihæmolysin and 4 K antileucocidin, the former having fallen slightly while the latter increased eightfold.

EFFECT OF TOXIN ON THE RABBIT LEUCOCYTE

If rabbit's blood is substituted for human in the leucocidin titration of a filtrate which contains a feeble α -hæmolysin but powerful leucocidin, the result will be comparable to that obtained by the use of human cells; the phagocytes will be destroyed by dilutions of toxin which leave the red cell untouched. The rabbit neutrophil, in fact, appears to be somewhat more susceptible to leucocidin than is the human cell.

But if a filtrate strong in α -hæmolysin but almost wholly lacking in leucocidin, such as is produced by

strain Wood 46, is tested against both human and rabbit blood, the results of the two titrations will be strikingly different. With the human cells in very low dilutions of the toxin there may or may not be some degree of hæmolysis or of damage to the leucocytes or both. This destructive effect has usually disappeared in dilutions as low as 1 in 4, and it is impossible to decide whether it is due to a slight susceptibility of the leucocytes to α -hæmolysin, to a trace of true leucocidin, or to other factors, possibly non-specific, present in undiluted filtrates. With rabbit blood hæmolysis, of course, occurs, but this is accompanied quantitatively by destruction of the leucocytes. There seems to be no reason to attribute this phenomenon merely to the accompanying hæmolysis, since in the case of human cells hæmolysis is not necessarily accompanied by any destruction of the leucocytes. It would rather seem that the rabbit leucocyte, like the rabbit red cell, is destroyed by α -hæmolysin against which human cells, both red and white, are relatively, if not absolutely, resistant.

The appearance of a rabbit leucocyte destroyed by α -hæmolysin is different, as a rule, from that of a human or rabbit cell destroyed by true leucocidin. In the latter case the cell, in an effective concentration of leucocidin, takes up a spherical form, the granules being arranged mainly at the circumference; in the presence of an excess of toxin the cell bursts and the granules are set free, and this appears to occur invariably in the making of a dried film once the cell has become spherical. But the rabbit neutrophil, killed by α -hæmolysin, appears to be less fragile and commonly retains the granules, clustered in one part of the cell, even in a dried film.

It seems possible that this difference in the morphology of the rabbit neutrophil, according as it is killed by α -hæmolysin or true leucocidin, may account for the existing uncertainty as to staphylococcal leucocidin, whether it is to be regarded as distinct from, or identical with, α -hæmolysin. It is possible that the different methods available for the demonstration of leucocidin may yield essentially different results. Thus the Neisser-Wechsberg test is based on the fact that a live leucocyte consumes oxygen and will therefore decolorise methylene-blue and that a dead cell will not. But there is no reason to assume that the granules or other substances released from a cell destroyed by true leucocidin should not still be capable, for a time, of absorbing oxygen. Further work is clearly necessary on the subject, but it may be pointed out that tests such as the Neisser-Wechsberg provide less direct evidence of the condition of cells than does the microscope and have the further disadvantage that they involve the use of animal and not human cells.

THE ANTITOXINS IN NORMAL HUMAN SERUM

Many human sera have now been tested for staphylococcal antitoxin by these methods. Amongst them 55 normal sera taken at random from those sent for the Wassermann test may be considered first.

It soon became obvious that the antileucocidin in human serum varies much more than the antihæmolysin. But the quantity of serum available was usually too small to allow a separate series of dilutions for each factor. As a routine therefore four tubes of comparatively widely spaced dilutions were used for each form of test, the first tube containing undiluted serum and each of the others three-eighths of the quantity in the preceding tube. Thus

serum, which completely neutralised the test dose of hæmolysin in the first tube only, contained 0.4 unit, in the second 1 unit, in the third 3 units, and in the fourth 8 units. The figures for the leucocidin tubes in terms of K-serum were 0.01 K, 0.027 K, 0.07 K, and 0.19 K.

Of 55 sera, 41 were found to contain 0.4 unit of antihæmolysin per c.cm., 13 contained 1 unit, and one 3 units, giving an average of 0.59 unit. This figure is probably a little lower than would have been obtained by a more accurate estimation, but it agrees sufficiently with the figures obtained by other workers.

In the antileucocidin estimations, 10 sera were equivalent to 0.01 K, 18 to 0.027 K, 19 to 0.07 K, and 8 to 0.19 K or more. The average figure thus obtained is 0.063 K, but if the 8 sera with titres of 0.19 K or more are omitted the average of the remaining 47 is 0.041 K. This latter figure is probably the more useful, for, as will be shown later, a serum titre of 0.19 K is usually indicative of existing or recent staphylococcal infection.

CULTURAL AND SEROLOGICAL INVESTIGATIONS CARRIED OUT ON PATIENTS

During the past eighteen months staphylococcal toxoid, as supplied by the Wellcome Laboratories, has been used at the London Hospital in the treatment of a series of cases of staphylococcal infection, the patients selected being for the most part examples of uncomplicated chronic furunculosis. A sample of serum was first obtained and then a series of injections was given at weekly intervals beginning usually with 0.25 c.cm. toxoid diluted 1 in 10 and working up to 0.5 c.cm. undiluted. After a total of at least 1 c.cm. of undiluted toxoid had been injected a second sample of serum was obtained.

In addition cultures were made when possible from lesions and latterly also from the anterior nares in order to confirm Dolman's observation⁵ that in chronic furunculosis virulent cocci are often present in the nose for long periods and may be carried from there to other parts of the body by the fingers. Eighteen cultures were made from the nares of patients not suffering from nasal lesions, and in all but 4 of these *Staphylococcus aureus* colonies grew out. From 7 of these strains filtered toxins were prepared and compared with toxins produced by cocci isolated from a lesion in the same patient. In all but 1 case the two toxins were sufficiently similar to suggest that the lesion-producing strain was being carried in the nose.

SERUM-ANTITOXINS IN CHRONIC STAPHYLOCOCCAL INFECTION

In a separate paper Dr. Burrows proposes to discuss the clinical effects observed in patients treated with toxoid injections. Only laboratory results therefore will be considered here.

Table II. shows the findings in 22 cases in which the full course of injections was given and in which the antihæmolysin and antileucocidin content of the serum was estimated both before and after treatment.

In this series the average figures for antihæmolysin before and after treatment are 1.8 units and 8.3 units respectively; but in only 4 cases was the average figure of 1.8 reached or surpassed before treatment, and of these 2 were cases of long-standing acne complicated by staphylococcal infection. If these two cases, Nos. 2 and 5, are omitted, the average titre before treatment is 1.14 units, a figure less than twice the normal 0.59.

The average antileucocidin titres before and after treatment are 0.22 K and 0.24 K. The insignificant

difference between these two figures is probably due to the fact that the toxoid used was prepared from filtrates of the type obtained from strain Wood 46, which gives very little leucocidin. But the average titre before treatment, 0.22 K, is important if the normal figure is accepted as 0.043 K. This five-fold rise was presumably due to the presence of

TABLE II

Case.	Sex and age.	Anti-hæmolysin units.		Anti-leucocidin in terms of K-serum.		
		B.	A.	B.	A.	
1	M41	2	3	0.1	0.1	Boils 35 years.
2	M28	5	11	0.32	0.32	Acne + +. Boils 6 years.
3	M22	1.5	3	0.16	0.16	Boils 1 year with interval.
4	F20	1.5	8	0.08	0.16	Diabetic. Boils 3 months.
5	M28	3	11	0.08	0.16	Acne + +. Boils many years.
6	M34	3	11	0.08	0.08	Boils 4 months.
7	F45	0.4	5	0.04	0.04	Acromegaly. Blepharitis 4 years.
8	F14	1.5	17	0.16	0.16	<i>S. abus</i> . Severe boils on face 2 years. Mentally feeble.
9	M34	1	26	0.16	0.08	Boils 18 months.
10	M36	0.7	5	0.08	0.32	8 months severe boils.
11	M22	0.7	5	0.16	0.32	1 year boils with interval following toxoid treatment.
12	M39	0.7	5	0.32	0.32	Boils 3 months.
13	F31	1.5	8	0.64	0.32	Recent suppuration of glands of neck.
14	F29	1.5	3	0.32	0.32	Boils 18 months with interval following toxoid.
15	M28	1	8	0.32	0.32	Boils 5 years.
16	F20	0.4	2	0.08	0.08	Boils 9 months.
17	M59	0.4	5	0.32	0.32	3 weeks carbuncle.
18	M51	0.7	26	0.32	0.64	2 weeks large carbuncle.
19	M23	1	5	0.16	0.16	Boils at intervals for 7 years.
20	F12	0.7	3	0.16	0.16	6 months boils in axilla.
21	F45	1.5	5	0.64	0.64	9 months many boils.
22	M40	1	8	0.08	0.16	2 weeks boils.

B. = before; A. = after.

infection and its amount is significant. It suggests that in cases of chronic superficial staphylococcal infection the spontaneous serum-antitoxin response to leucocidin is better than that to hæmolysin.

This conclusion is supported by a consideration of the individual cases in the present series. In Cases 4, 5, 10, 11, 18, and 22, the antileucocidin titre rose between the two tests and this can be correlated with a persistence of the infection during the period of treatment, which was noted in all these cases. In Nos. 9 and 13 the antileucocidin titre fell slightly and no lesions occurred while the injections were being given. On the other hand, one case, No. 6, was still getting occasional boils at the end of the course but his antileucocidin titre, originally low, had fallen.

Nine other cases of primary superficial staphylococcal infection were treated with toxoid but through various accidents of non-attendance the second sample of serum at the end of treatment was not obtained. It is legitimate to add the figures obtained from the original sera of these patients in order to increase the number of cases on which the average titre in serum before treatment is based. The average figure for antihæmolysin in 29 cases thus becomes 1.2 units and for antileucocidin 0.25 K, Cases 2 and 5 in the original series being again omitted.

SERUM-ANTITOXINS IN CASES OF SEVERE INFECTION

The serum was also examined in 8 cases of more acute and serious staphylococcal infection. (Table III.)

This series is admittedly too small to be of much statistical value yet the cases fall into two groups, the first four being bled one week or less after the infection began and the second group after from two weeks to a month. The difference in the serum-antibodies

between the two groups is very striking. In the first group, the second and fourth cases were rapidly fatal, but the other two, both examples of face infection with much œdema, were clinically "settling" when the serum was taken. It seems, therefore, that with sound non-specific treatment clinical improvement may take place before the antibody titre is

TABLE III

Case.	Sex and age.	Anti-hæmolyisin units.	Anti-leucocidin in terms of K.	Remarks.
1	F 53	0.4	0.02	Lip infection with œdema. Bled after 1 week.
2	M 11	0.4	0.04	Ileum infection fatal. Bled within 1 week.
3	M 7	0.4	0.08	Nose infection with much œdema. Bled within 1 week.
4	F 23	0.4	0.01	Lip infection. Fatal.
5	M 53	8	2.56	Subscapular infection. Bled after 4 weeks.
6	M 32	0.4	1.28	Infected hand.
7	M 15	5	1.28	Osteomyelitis of femur. Bled after 2 weeks.
8	M 35	5	2.56	Multiple deep abscesses Bled after 1 month.

appreciably raised. Three cases in the second group show the typical rise of anti-hæmolyisin titre which occurs after deep-seated staphylococcal infection, but in addition there is an even greater proportionate rise in antileucocidin. The figure of 2.5 K, twice obtained, appears both remarkable and significant. The other case, No. 6, one of severe hand infection, showed a great rise in antileucocidin titre but none in anti-hæmolyisin. There is no reason to doubt the accuracy of this titration, but it was unfortunately impossible to confirm it on a second sample of serum, since the patient when on the point of recovery died of an intercurrent infection.

TOXINS

In a previous paper¹ evidence was brought forward indicating that it is usual to find that strains of staphylococci isolated from serious lesions are capable of producing leucocidin in considerable amount, whereas it is generally agreed that no such correlation can be made between virulence against human beings and the ability to produce α -hæmolyisin. In the course of the present work toxins were prepared from 25 strains isolated from furunculosis cases, from 6 strains derived from cases of serious infection, and from 5 strains associated with sycosis barbe. It was found that hæmolyisin production bore no relationship to the severity of the lesion from which a strain was isolated; but that all the strains from the cases of serious infection and all but 4 of the 25 strains from boils produced leucocidin in considerable amount, while no strain derived from sycosis produced any demonstrable leucocidin at all. There can be no doubt that these results have been modified to some extent by the recent observation that filtration of a toxin removes or greatly diminishes a toxic factor which is only present in small amount and thereby exaggerates differences of toxigenicity of different strains. None the less it seems probable that strains capable of invasion of tissue, such as occurs in the true boil and in more serious lesions, will usually be found capable of producing leucocidin in considerable amount, whereas in sycosis invasion of tissue is slight and the cocci present appear to be feeble leucocidin producers.

Discussion

It is now generally admitted that staphylococcal toxin has several different properties. The majority

of workers hold that its α -hæmolytic, necrosing, and lethal activities are probably due to the same substance. The β -hæmolyisin and the coagulase have been shown to be separate bodies.

As regards the leucocidin, some workers hold it to be a distinct entity, whereas others believe that the α -hæmolyisin destroys leucocytes as well as red cells, and that the staphylococcus does not produce a true specific leucocidin. The present work suggests that this divergence of opinion has arisen from the double action of α -hæmolyisin on rabbit leucocytes and red cells, whereas many strains of staphylococcus produce also a true leucocidin capable of destroying all phagocytic leucocytes both in human and rabbit blood, but without effect on red cells and lymphocytes. This leucocidin is capable of acting as an antigen and gives rise to a specific antibody either on injection or following its liberation into the tissues by the cocci in the course of infection.

RÔLE OF THE DIFFERENT TOXINS IN STAPHYLOCOCCAL INFECTION

It would be very unwise to attribute all the manifestations of staphylococcal infection to toxins produced by the cocci. For example, the remarkable ability of these organisms to survive on the skin and in the nares is probably a most important factor in the maintenance of chronic furunculosis. Cellular constituents such as the carbohydrate substance recently described by Julianelle⁶ may be of the utmost importance, for example in the production of hypersensitivity. These two factors together may conceivably lie at the root of the difficult problem of sycosis.

But the importance of the toxins, particularly when the infection has penetrated beneath the surface of the skin, is surely unquestionable. It is difficult not to correlate the massive local necrosis produced by the injection of α -hæmolyisin into a rabbit's skin with the local necrosis which characterises the ordinary furuncle, the commonest of staphylococcal lesions. The comparatively poor development of circulating anti-hæmolyisin in many patients suffering from chronic furunculosis may be due to the fact that the toxin is fixed locally in the tissues and does not therefore stimulate a general immunity. In a deeply seated abscess the absorption of toxin appears to be easier since the circulating anti-hæmolyisin commonly rises considerably.

There is no need to labour the importance of a leucocidin capable of destroying the phagocytic cells of the blood. Its presence might be expected to facilitate the invasion of the tissue by the cocci and indirect evidence is here supplied in support of this view by the fact that strains of cocci, isolated from lesions in which real invasion of tissue has occurred in an otherwise healthy patient, nearly always produce leucocidin in considerable amount.

This finding has an important bearing on the methods used for the production of antitoxic serum which is used in cases of serious acute infection to prevent further invasion of tissue before the body has had time to produce its own antibodies. It is possible that in these cases the value of antitoxic serum depends more on the content of antileucocidin than of anti-hæmolyisin. It is not uncommon to isolate from a rapidly fatal case of staphylococcal septicæmia an organism which produces only a feeble hæmolyisin but a strong leucocidin. Even if it is true that toxæmia and death result directly from the accumulation of hæmolyisin and not of leucocidin, treatment should be directed towards

the prevention of further invasion as well as to the neutralisation of toxin already formed.

Through the kindness of Dr. Parish of the Wellcome Laboratories it has been possible to estimate the antileucocidin titre of 24 "normal" horses. Of these, 6 had a titre of 0.2 K but none of 0.4 K, and of the remainder the majority showed a titre of 0.05 K or less. Two horses have been immunised against a toxin rich in leucocidin, one by Dr. Parish and the other by Dr. McClean at the Lister Institute, and in each case a titre of 4 K was obtained, the titration, however, being only approximate, since 100 per cent. differences were used both for the estimation of the toxin employed and in the ultimate test of the serum. More recently a sample of concentrated serum kindly supplied by Drs. Dolman and Kitching from the Connaught Laboratories, Toronto, has yielded a titre of approximately 12 K. It would seem probable that a figure of at least 3 K should be readily obtained in the crude serum by the use of a suitable toxin. In comparison with these figures it would seem to be rare for a horse immunised with hæmolytic filtrates such as are yielded by strain Wood 46 to attain a titre of more than 1 K in the crude serum. In the near future it is intended at the Wellcome Laboratories to immunise a horse against a leucocidal toxin in which the hæmolysis has been neutralised, in the hope of establishing, if possible, a maximum antileucocidal figure for future reference.

The importance of leucocidin in chronic infection is probably much less than in the acute case, particularly with regard to treatment by toxoid. Whereas in chronic infection the patients often develop little circulating antihæmolysin, their antileucocidin response is usually considerable. It may be for this reason that serious staphylococcal infection seldom occurs in patients already suffering from chronic furunculosis. Even so, it would seem on general grounds to be desirable that the antigenic efficiency of toxoid should be maintained with reference to leucocidin as well as to α -hæmolysin.

Summary

1. A method is described for obtaining a staphylococcal toxin which, with a suitable strain, is reasonably rich both in α -hæmolysin and leucocidin. It is observed that filtration may remove all leucocidin from a toxin originally feeble in this respect.

2. Methods are given for the estimation of leucocidin in toxin and of antileucocidin in serum. A convenient unit of antileucocidin is suggested in terms of the standard K serum, B 8760, issued by the Wellcome Laboratories.

3. A description is given of the susceptibility of the rabbit leucocyte to α -hæmolysin, towards which the human cell is relatively if not absolutely immune.

4. Confirmation is supplied of Dolman's finding that in chronic furunculosis virulent staphylococci are commonly carried in the anterior nares.

5. Evidence is produced indicating that in chronic superficial staphylococcal infection the antileucocidin of the serum commonly shows a significant increase, whereas the antihæmolysin often does not; also that in deep-seated infection the rise in the anti-hæmolytic titre of the serum is accompanied by a relatively greater increase in antileucocidin.

6. A comparison of the toxigenic capacity of a number of different strains of cocci suggests that strains which have succeeded in invading human tissue will commonly be found capable of producing leucocidin in considerable amount.

The importance of the concentration of antileucocidin in antitoxic serum is discussed.

My thanks are due to Dr. P. N. Panton for his unflinching advice and criticism; to Dr. H. J. Parish and Dr. Joyce Wright of the Wellcome Laboratories for their criticism and for the supply of standard serum and hæmolytic toxin; also for their collaboration and that of Dr. McClean, of the Lister Institute in the immunisation of horses; and finally to Dr. Burrows and other members of the medical staff of the London Hospital for access to the human material on which the work is based.

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OPERATION FOR FEMORAL HERNIA BY A MIDLINE EXTRAPERITONEAL APPROACH

WITH A PRELIMINARY NOTE ON THE USE OF THIS
ROUTE FOR REDUCIBLE INGUINAL HERNIA

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THE admission of a case of femoral hernia to my surgical unit is so rare as to be something of an event. During the past year (July, 1934-June, 1935) we have operated on 2 such cases as against 205 of inguinal hernia, a high incidence considering the fact that in the nine previous years only 3 other patients with femoral hernia were admitted to my beds. I venture therefore to describe an operation that I have performed once only, in the hope that others with better opportunity will test the method and assess its value.

At Kasr-el-Aini Hospital the frequency of bilateral lesions of the urinary tract has made us familiar with the midline extraperitoneal approach to the pelvic ureter, and using this route recently I was struck by the admirable exposure it gave of the whole region of the femoral ring. In a thin patient, as soon as my hand had displaced the peritoneal sac from beside the bladder, the view obtained of the four relevant structures—Gimbernat's ligament, the hinder edge of Poupart's, the fascia covering the pectineus, the external iliac vein—was like that in a specimen prepared for demonstration. This clear view showed me that the femoral ring could easily be closed by turning forward a flap of the dense fascia covering the pectineus muscle, and sewing it to the hinder edge of Poupart's ligament.

We soon had the opportunity of putting these ideas into practice. A girl aged 14 (1935, No. 13647), who had developed phthisis five years previously, was admitted with bilateral femoral hernia of one year's duration. Both herniæ were reducible, and both projected through the saphenous opening without turning towards the anterior superior spine (Fig. 1).

THE OPERATION

Under gas-oxygen anæsthesia on July 10th, 1935, through a midline incision, I separated the recti at and below the navel, and stripped the unopened peritoneum from the sides of the bladder and from the pelvic wall. This at once gave a notable view

of both hernial sacs, which stood out from the peritoneum like horns from a snail, and passed into the femoral rings (Fig. 2). After a very little blunt dissection the two sacs were delivered from the canals and brought within the abdominal wall; they were

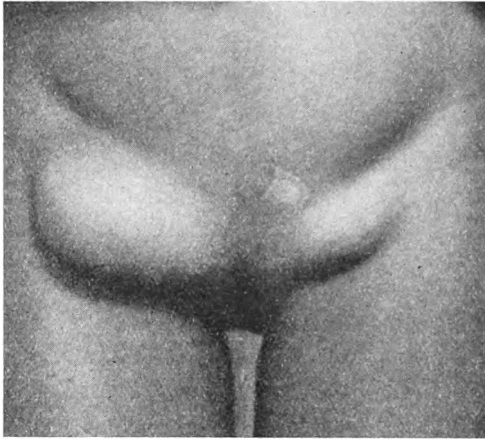


FIG. 1.—The two femoral herniæ. (The incision extended from the pubic symphysis to the left side of the navel.)

then excised and their origins were closed. The right femoral ring admitted two fingers; the left was slightly smaller. Both were shut off in the following way, the entire operation "from skin to skin" lasting 32 minutes.

The fascial flap.—After retracting the external iliac vein outwards, I made two incisions through the fascia covering the steep slope of the pectineus muscle; the first, just in front of and parallel to Cooper's ligament, extending out for $1\frac{1}{2}$ inches from the free edge of Gimbernat's; the second running down and forwards at right angles to the outer end of the first. I then had a triangular flap of strong fascia—pedicled in front—which I turned forward and united by sutures to the hinder edge of Poupart's ligament. This closed the femoral ring (Figs. 3 and 4 A). The raw upper surface of the pectineus muscle remained bare, and to cover it I sutured the hinder edge of Poupart's ligament to Cooper's ligament. The second line of suture, however, was not essential and would seldom be so easily accomplished as in this case where Poupart's ligament was extremely lax.¹

I found that my assistant's hand formed the best retractor; his palm held the abdominal wall, while the tips of his fingers drew the external iliac vein aside as they slid outwards over the fascia covering the the pectineus.

The wound healed by first intention.

¹ The fascial flap can be raised in the opposite direction with its pedicle behind at Cooper's ligament (Fig. 4 B). This avoids leaving any raw surface of the pectineus exposed, though I doubt whether that has any real importance since the muscle covers the pubic ramus thinly at this proximal level and the danger of a recurrent hernia burrowing into its fibres is unlikely.

COMMENT

This method appears to have several advantages, apart from its obvious use in bilateral cases.

(1) When the recti have been separated, the sac is found by a gentle movement of the hand, without dissection. Its proximal part is at once delivered naked to the surgeon, and serves as a guide to the rest.

(2) The variably developed, unreliable, conjoined tendon plays no part in this operation. At best its arch is resilient and must be fastened under stress to Cooper's ligament. Should occasion, however, arise for its use, better access to the "tendon" is got by this route than by opening the inguinal canal.

(3) In contrast to the conjoined tendon the thick fascia covering the pectineus muscle can be relied on to furnish a strong flap that will join Poupart's ligament without tension and close the femoral ring.

(4) The immediate access to a wide surface of parietal peritoneum that is given by this approach makes it possible to close and invaginate the sac at its actual origin, abolishing the small diverticulum which may remain to favour recurrence when the neck of the sac is drawn down into a wound for ligature.

THE MIDLINE METHOD IN INGUINAL HERNIA

After the foregoing account was written I made (through the courtesy of Prof. A. F. Bernard Shaw) a preliminary trial of this extraperitoneal route in a cadaver with an inguinal hernia of moderate size. I found that the midline incision gave the same admirable exposure of the origin of the sac as in femoral hernia. The sac could be easily delivered, extraperitoneally, within the abdominal wall, and dealt with there by ligature and invagination. Access to the internal ring was good, and it was easy to repair it from within. Further experience has shown that this repair is always easy if the anæsthetist keeps the abdominal wall lax. Seen by this approach, the orifice presents an unusual and striking appearance. Its posteromedial lip is beautifully defined by a thickening of the transversalis fascia. The anterolateral boundary of the ring is formed by unthickened fascia covering the deep surface of the internal oblique muscle. By suturing these two

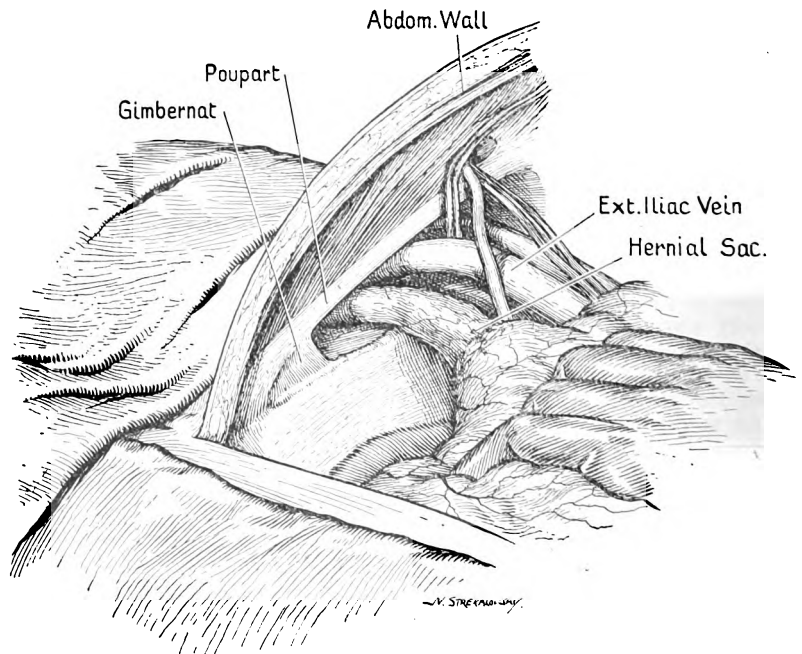


FIG. 2.—The right femoral sac seen from the left side, after separating the recti, when the hand has displaced the peritoneum.

boundaries of the ring together from above downwards the internal ring can be narrowed until it just transmits the cord.

I used the method first for inguinal hernia in the operating theatre in a case that was direct, bilateral,

a pedicled flap cut from the deep surface of the rectus muscle.

True and false necks.—Recently the extensive view of the parietal peritoneum obtained by the midline approach has revealed a condition that may have an

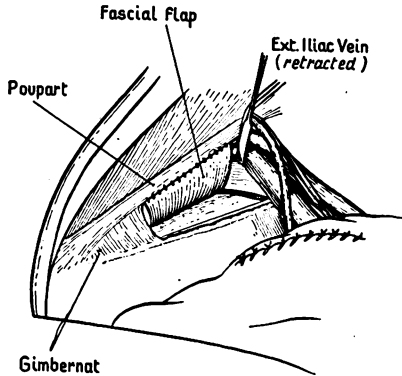


FIG. 3.—The flap cut from the pectineus fascia turned forward for suture to Poupart's ligament.

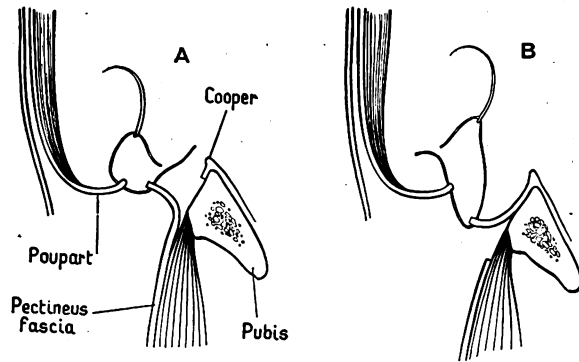


FIG. 4.—(A) The same flap as in Fig. 3, seen in longitudinal section. (B) Alternative method of cutting the fascial flap. The pedicle is at Cooper's ligament.

and reducible. After separation of the recti I was able at once to pick up each sac, and both were completely isolated and delivered within the abdominal wall in less than five minutes from the first incision. Narrowing of the ring too was rapidly accomplished by suture from within.

Indirect hernial sacs naturally are more closely attached by their outer surface to the spermatic vessels, but at this level, where the vas is already turning sharply away from the sac to enter the pelvis, their separation is simplified. It must however be remembered that when the peritoneum is raised from the abdominal wall, the vas deferens—though placed in extraperitoneal fat—will be raised too. The vas is lifted up on the tough fibrous cord of the obliterated hypogastric artery which underlies it and adheres to the peritoneum. Traction on the hernial sac also withdraws the vas, with the spermatic vessels, from the scrotum, so that sac, vessels, and vas lie loose and intricate within the belly wall.

It is notoriously hard to find planes of cleavage between slack structures, but here the difficulty is easily met by a second assistant, who grasps the scrotum beneath the towels and gently draws the spermatic cord towards the patient's feet. This simple precaution restores anatomical relations and greatly expedites the isolation of large hernial sacs.

The origin of the sac, which is closed by ligature or suture, can often be invaginated. To avoid injuring gut the "purse-string" should be passed while the sac is still open.

If reinforcement were required for the closure of the internal abdominal ring, it would be easy to cover the weak spot with

important bearing on recurrence after "radical cure." The tubular hernial sac often grows much wider just inside the internal ring and forms there a peritoneal pouch proximal to the so-called neck. The junction of this pouch with unevaginated parietal peritoneum is the true neck, origin, or inlet of the sac, and unless that inlet is shut recurrence is likely. It would however be difficult through the ordinary approach to avoid mistaking the wide proximal pouch for unevaginated peritoneum; the false, apparent neck would then be closed instead of the pertinent real one (see Fig. 5).

The more I use the midline route for operating on patients suffering from inguinal hernia only, the more I am struck by the fact that femoral rings often gape widely and admit a finger easily; yet there is no corresponding evagination; the peritoneum lies smoothly over them. I believe that the testimony of the wide field exposed by the extraperitoneal approach will confirm the theory that, apart from wounds or operation, a preformed congenital sac is an essential cause of most inguinal herniæ. Cure of the condition will only be radical, in the literal sense of that word, when, after excising the sac, we close its actual origin, and my impression is that in many cases repair of the canal must be superfluous, especially when the canal is valvular and the hernia indirect.

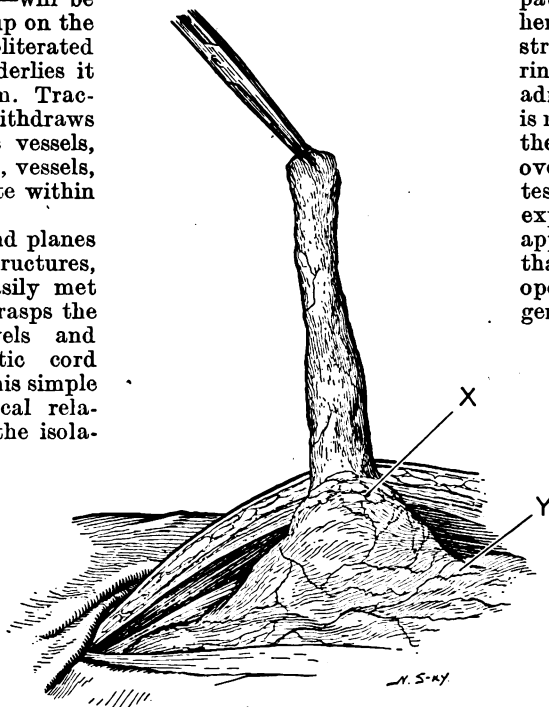


FIG. 5.—A wide pouch or diverticulum proximal to the false fat-encircled "neck" of the hernial sac (X)—a common finding (see text). The true inlet of the sac is where this pouch joins parietal peritoneum (Y). The junction is sometimes marked internally by a rim-like thickening.

My thanks are due to Dr. Mohamed Hasan el Zeneini, resident surgeon in the surgical unit, for much useful coöperation, and to Mr. N. Strelakovsky for his excellent drawings.

TEMPORARY PARALYSIS OF THE DIAPHRAGM IN THE TREATMENT OF PULMONARY TUBERCULOSIS

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It is almost five and twenty years since Stuert and Sauerbruch first induced artificial paralysis of the diaphragm as an accessory mode of treatment for pulmonary tuberculosis. Sauerbruch had practised phrenicotomy—or section of the stem of the phrenic nerve within the chest—at a much earlier period when carrying out the radical treatment of diaphragmatic hernia.

As phrenicotomy became more generally performed, it was apparent that paralysis of the diaphragm often failed to appear after the operation, and in 1922 Felix, after his masterly study of the anatomy of the nerve and its accessory branches, proposed and carried out the operation of phrenic evulsion, in which the nerve was exposed in the neck and its peripheral end was seized with forceps and evulsed from the chest. In this operation often a length of 10 cm. of the nerve was removed and a permanent paralysis of the hemidiaphragm naturally resulted.

In 1931 one of us (L. O'S.) published the results of a series of operations of the Felix type carried out in the Sudan; and up to that date phrenic evulsion appeared to satisfy his requirements except in the rarest cases. In that year, however, he had the opportunity of examining a patient subjected to a phrenic evulsion on the left side which had been followed by very distressing symptoms probably caused by a displacement of the stomach following an ascent of the diaphragm to the level of the third rib. Despite the rarity of this syndrome—Davison has recently reported 568 cases of phrenic evulsion without complication—this case was enough to bring the question of temporary paralysis into consideration, especially as other examples of gastric and cardiac distress following phrenic evulsion on the left side have been recorded by Rickers and by several others.

During the last three years it has been our usual policy in the treatment of pulmonary tuberculosis to induce a temporary rather than a permanent paralysis of the diaphragm. The only notable exception to this rule is in an operation undertaken for the obliteration of a persistent empyema cavity in the chest, when permanent paralysis is induced.

TECHNIQUE

The technique of operation is much the same as that described in a previous paper (L. O'S.).

The patient is given an injection of omnopon gr. 1/3 and scopolamine gr. 1/150 an hour before the operation. During the operation he lies on his back with a narrow sand-bag beneath the neck, fitting exactly between the occiput and the first dorsal vertebra, with his chin pointed up and away from the operation area. The line of incision, two fingers-breadth above the clavicle, is some 2 cm. in length, passing horizontally over the posterior border of the sternomastoid muscle in such a way that two-thirds of the incision is lateral to the muscle. An intra-

dermal weal is raised with a solution of $\frac{1}{2}$ per cent. Novocain in the line of the incision, and with due precautions 3 c.cm. of the solution is injected into the deeper underlying tissue.

After incision of the skin and platysma the posterior border of the sternomastoid muscle is exposed, defined by blunt dissection and retracted inwards. The posterior belly of the omohyoid is then exposed and retracted downwards and then the fascia covering the scalenus anticus comes into view. A subfascial injection of the anæsthetic solution is then carried out and, after a minute incision of the fascia, the surface of the muscle is defined by blunt dissection. The phrenic nerve is exposed running an oblique course towards the inner border of the muscle, and in the lower part of the wound it is seen disappearing beneath the transverse cervical vessels. The nerve is gently isolated, raised on a blunt hook, injected with novocain, and crushed with a strong pair of artery forceps. The wound is then closed by suture.

It will be observed that no attempt is made to identify and crush the accessory phrenic nerve, although this would seem in theory desirable. While recognising the importance of Felix's original work on the "neben-phrenicus," we can only state that the operation as described has produced paralysis in 43 out of the 44 cases, and in the single failure a more extensive dissection still failed to produce the desired result. In view of this we are disinclined to modify the simple technique outlined.

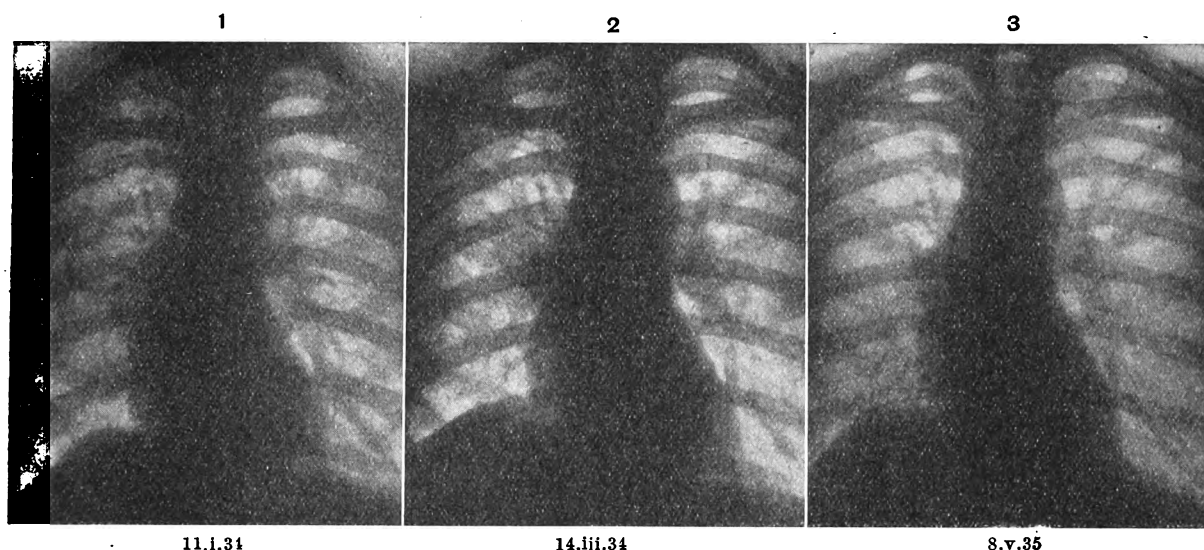
It must also be recognised that in phrenicoplasty,* as in phrenicotomy, there are certain local operative risks, and the operation should only be carried out by a surgeon sufficiently experienced to deal with the serious hæmorrhage which may result from the accidental wounding of an aberrant branch of the subclavian artery. It is well to remember that fatalities have been recorded from this complication. A second local complication, which may also have fatal results, is air embolism following a wound of the external or internal jugular vein. If part of a patient's lung is already rendered useless by disease, his reaction to the temporary blockage of part of the pulmonary circuit, which follows the admission of a small quantity of air into a systemic vein, is considerably more alarming than the trivial disturbance which is the only usual sequel to such an accident in a patient with healthy lungs.

RESULTS

In 43 out of the 44 cases which are the subject of this communication, phrenicoplasty produced a paralysis persisting for an average period of six months—in one case movement returned after five months and in another paralysis persisted for nine months—and it appears to give rather more consistent results than the alternative measures. In a recent account of the injection of alcohol into the nerve Morin records periods of paralysis ranging from five to fifteen months. In 4 of our cases a second operation was carried out when a further period of paralysis of the diaphragm seemed indicated, and in 1 of these paralysis failed to appear.

It is not our intention here to discuss the value of hemiparesis of the diaphragm in the treatment of phthisis. A recent review of the question by Morriston Davies renders this superfluous. There is also an analysis of 330 operations by Schwarzmann and Waltach and an account of 654 operations by Nehil and Alexander. The views expressed by one of us in an earlier paper as to the value of the operation have undergone little change. One of its most valuable uses is to supplement the régime of absolute rest imposed on the patient suffering from

* This term, derived from the Greek $\theta\lambda\alpha\omega$ (I crush, or bruise), is perhaps preferable to "phrenic crush."



11.1.34

14.iii.34

8.v.35

FIG. 1.—Cavity system in right middle zone. Sputum contains tubercle bacilli.

FIG. 2.—Right leaf of diaphragm raised and paralysed. No T.B. in sputum.

FIG. 3.—Right leaf of diaphragm raised but moving. No T.B. in sputum. Patient at work.

an exudative lesion. The old controversy as to the value of paresis of the diaphragm in the case of lesion of the upper lobe seems to have been settled by the work of Weber on the röntgenkymography of the lung. As Kremer and von der Weth have also shown, diaphragmatic movement has a very definite effect on the upper lobe provided adhesions have formed in the interlobar sulcus, and the expert radiologist is now in a position to decide this point with certainty before operation is contemplated. Phrenicosthasty is never considered as an alternative to artificial pneumothorax. It is sometimes used to supplement an incomplete artificial pneumothorax, and it is often employed, we believe usefully, as a test operation before proceeding to more radical surgery; only rarely is it carried out as an independent measure. We have probably made too little use of the operation as a palliative measure for the irritative cough, dragging pain, and dyspepsia of the late case of phthisis.

CASE-HISTORY

Male, aged 27; two years' history of pulmonary tuberculosis commencing with a large hæmoptysis. On admission the right lung showed cavitation in both upper and middle lobes, with increased root shadows on the left side (Fig. 1). Artificial pneumothorax was tried without success, and a phrenicosthasty performed on the right side in January, 1934; the sputum was then markedly positive. Paralysis of the right leaf of the diaphragm was produced, paradoxical movement being observed on screening. Fig. 2 shows the radiographic appearance 2½ months after operation—the gradual disappearance of the cavities on the right side and the clearing of the contralateral side will be noted. The sputum was now negative and there was complete subsidence of all constitutional symptoms, the patient (a former bank clerk) now being up all day and doing 4½ hours' daily occupational therapy in the village settlement.

The initial duration of paralysis of the hemidiaphragm was 7 months, and at the end of this period a second phrenicosthasty was performed to maintain the paralysis. After this second operation, normal movement was observed to have returned at the end of 5 months. Fig. 3 shows the radiographic appearance at the end of this period; the diaphragm on the right side is still somewhat raised, while the cavitation is now completely resolved.

The sputum has remained consistently negative and the

patient has gained 22 lb. in weight. He has now returned to his normal employment.

CONCLUSION

Some have been led to advocate a crushing of the phrenic nerve rather than its evulsion because of the danger of producing some lesion within the chest during the latter procedure. We do not consider phrenic evulsion, discreetly and carefully performed, a dangerous operation but have adopted phrenicosthasty on quite other grounds. We have observed an increasing number of patients with bilateral phthisis for whom some form of bilateral collapse operation would offer a prospect, and the only prospect, of cure, but a paralysed diaphragm has ruled out such a possibility. In the young patient a paralysed hemidiaphragm does not produce signs of respiratory distress—indeed in a previous paper one of us has described patients who tolerated complete paralysis of the diaphragm with equanimity. But it has recently been suggested that in middle age paresis of the diaphragm may constitute a more serious handicap: Kochs found that phrenicotomy produced a greater reduction of vital capacity in middle-aged patients than in young patients. The possible detrimental effects of the paralysis on cardiovascular function in later life must also be borne in mind, and the recent experiments of Nissen and Wustmann on the effect of diaphragmatic movement on the caval blood flow are of interest in this connexion. We therefore believe that it will be of probable advantage for the patient described in the above case-history to have a healed tuberculous lesion and a moving diaphragm; for should his lesion again become active he is a suitable subject for any form of treatment which may be necessary, and if, on the other hand, his disease remains permanently arrested there is no chance of his having to pay for this benefit by an impairment of respiratory or cardiovascular function in his later life.

We wish to thank Dr. J. B. McDougall, medical director of Preston Hall, for permission to publish these cases, and Dr. A. Ross for his coöperation in their radiological investigation.

(References at foot of next page)

ACCIDENTAL TRANSMISSION OF MALARIA BY BLOOD TRANSFUSION

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LATE ASSISTANT PATHOLOGIST AND BLOOD TRANSFUSION
OFFICER AT THE HOSPITAL

With a note by

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PATHOLOGIST TO THE HOSPITAL AND DIRECTOR OF THE
BLOOD TRANSFUSION SERVICE

THE following is believed to be the first instance of the accidental transmission of malaria in the course of blood transfusion to be reported in this country.

The patient was a man aged 26. He was first seen by one of us (W. L. T.) in May, 1935, with a malignant growth of the nasopharynx; for this he received radium treatment at the Royal Hospital. He was readmitted in August, 1935, with a diagnosis of septicaemia secondary to an infection of the middle ear; he was then seriously ill and emaciated, and had been running a remittent temperature of up to 103° F. for five days. Under treatment the temperature subsided in a fortnight, leaving the patient in a very weak condition. A week later, although there had been no further evidence of activity of the infection, he appeared to be losing ground. A blood count showed: haemoglobin, 38 per cent.; red cells, 2,040,000 per c.mm., and white cells, 7900.

In view of the anaemia it was decided to have recourse to blood transfusion, and a first transfusion was given on August 24th, 1935. As donor, a brother-in-law was used; blood of both donor and recipient belong to Group O (IV. Moss). Eighteen ounces of blood were withdrawn and administered. The transfusion was followed by considerable clinical improvement; on August 29th the blood showed Hb. 58 per cent., and red cells 4,220,000. A second transfusion was given on Sept. 9th. The same donor was again used and 10 oz. of blood was withdrawn and administered. Both transfusions were performed by S. K. On both occasions the blood was citrated; infusion was carried out by the three-way syringe; the infusion needle was introduced by vein puncture without incision.

On Sept. 12th, three days after the last transfusion, the patient developed a high intermittent fever with rigors. Examination of the blood on Sept. 17th showed: Hb., 38 per cent.; red cells, 2,440,000; white cells, 4400; no morphological abnormalities of red or white cells. Blood culture was negative.

The temperature and the rigors persisted and the clinical condition so impressed one of us (W. L. T.), who had had considerable experience of malaria in the Far East, with its general resemblance to tertian malarial infection, that a further examination of the blood was asked for. On Sept. 19th further films of blood were taken both about one hour before and actually during the

occurrence of a rigor, and in these the parasite of benign tertian malaria (*Plasmodium vivax*) was demonstrated without difficulty. On treatment with quinine binhydrochloride grs. 20 daily the rigors ceased and the temperature rapidly subsided. Quinine was continued in decreasing doses for two months. The patient was last seen on Jan. 14th, 1936; he had then had no relapse, his general health had much improved, and incidentally no sign of the nasopharyngeal growth could be found.

The patient had never been out of England and the possibility of his having contracted malaria in this country appeared remote in the extreme. Suspicion fell on the infused blood. Inquiry elicited the fact that the brother-in-law who had acted as donor was a regular soldier who had served in India from 1927 to November, 1933. The only illness from which he had suffered while in India was sandfly fever; while abroad he had never had any rigors. In June, 1934, after his return to this country, he had a short series of shivering attacks each lasting two or three days; his own doctor gave him some medicine, after which these attacks ceased and he had been perfectly well since. While in India he had not received quinine prophylactically.

Examination of the donor's blood showed no malarial parasites.

NOTE BY DR. DYKE

The transmission of malarial infection by the infusion, either intramuscularly or intravenously, of infected citrated blood is of course a commonplace of antisiphilitic treatment. The main interests in the above case attaches to the transmission of the infection by the blood of a person who had never knowingly suffered from malaria. The infection was evidently contracted in India; but there seems to be no doubt that the donor experienced no symptoms of the disease while there. He was questioned as to his attack of sandfly fever; this appears to have been mild but true to type and the fever was unaccompanied by rigors. Symptoms of malaria did not appear until he had been six months in this country, and were then mild and unrecognised as such.

In all about a score of cases of transmission of malaria in the course of blood transfusion from donors not known to be suffering from the disease are now on record. The first was reported by Woolsey¹ in 1919. The transfusion of blood from an apparently healthy donor to a patient suffering from pernicious anaemia was followed on the same night by symptoms of malaria. Immediate examination of the blood both of donor and recipient showed malarial parasites, and in spite of the absence of symptoms the donor was evidently suffering from heavy malarial infestation. This is the only recorded case in which examination of the blood of the donor showed malarial parasites; their presence in sufficient numbers in the blood to be demonstrable in ordinary films apparently accounts for the extremely short incubation period of the disease in the infused subject.

The whole subject of the transmission of malarial infection in the course of blood transfusion has lately been minutely examined by Ackermann and Pilatov² at the Leningrad Institute for Blood Transfusion. They have collected in all a total of 18 cases recorded up to the time they wrote. They are impressed with the danger of introducing malarial infection by the use of blood of donors who have ever dwelt in a district in which malarial infection is endemic. They experimented upon the effect of keeping blood with and without the addition of quinine.

For conservation of the blood they used a solution consisting of sodium citrate 5.0 g., sodium chloride 7.5 g., potassium chloride 0.2 g., and magnesium sulphate 0.04 g. to one litre of distilled water. To this was sometimes added quinine hydrochloride to the extent of from 0.2 to

(Continued from previous page)

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1.0 g. to the litre. The blood was stored at 4° to 6° R. (5° to 8° C.). They found that, whether quinine had been added or not, after 12 hours' keeping the blood was always infective; after 24-72 hours it was sometimes infective, after 96 hours never. The addition of quinine seemed merely to decrease the severity of infection and possibly in some instances to render the blood non-infective.

Since the appearance of the work of Ackermann and Filatov, a further case has been reported by Harvier, le Brun, and Lafitte³ to the Société Médicale des Hôpitaux de Paris. The donor had been in Algiers for two years, ten years previous to giving the blood, and in Gaboon up to three years before; he had never knowingly suffered from malaria. He had regularly taken 0.25 g. quinine daily while abroad. In the discussion following the presentation of this case M. P. Émile-Weil said: "I have never had the annoyance of seeing malaria develop after a transfusion because I regard everyone who has been in the colonies or who has lived in a malarial country, even if they have not had fever, as being unrecognised malarial subjects (paludéen ignoré), and I refuse without having recourse to any biological tests to accept them as donors." M. Le Bourdellés, on the other hand, while admitting the existence of chronic cases only brought into evidence by the development of malaria after the infusion of their blood, expressed the opinion that these are "very rare occurrences and that a large number of malarial subjects after repatriation are completely cured from the clinical, hæmatological, and serological standpoints."

Various speakers in the course of this discussion made reference to "Henry's reaction" for the identification of malarial infection.

This reaction was described by Henry⁴ in 1928. Proceeding from the fact that malarial infestation leads to the liberation in the blood stream of iron and of melanin, he tried to demonstrate the presence of antibodies against these substances in the blood of malarial subjects. Using as antigens an albuminate of iron in the form of "Methafer Bouty," and melanin derived from ox retinae, he considered that he had been able to do this. Adida⁵ in 1929 repeated Henry's work and reported very favourably on it as a means of diagnosis of malarial infection. The test has since received a certain amount of attention; Greig, van Rooyen, and Hendry¹¹ and Wiseman¹² have been unable to agree with Henry's postulates as to the nature of the test, but appear to think it may have some use in the diagnosis of malarial infection.

Apart from the case of Grubb⁶ in which infection was conveyed from a recipient who was actually suffering from malaria to the donor, all recorded cases of the transmission of malaria by means of transfusion have been from subjects not known to be suffering from the disease. In those recorded by Oehlecker,⁷ Schnitzler,⁸ Mayanz,⁹ Harvier and others,³ and Nobécourt,¹⁰ and in the case reported above the donors were unaware that they had ever had the infection. In those of Oehlecker, Nobécourt, and Harvier the donors, while resident in malarial districts, had regularly taken quinine.

The evidence as to the existence of malarial infestation in the blood of those who never knew they had suffered from the disease is irrefutable. It is probable that a latent infestation in course of time dies out, but it is at present difficult to set a term to its persistence. In Nobécourt's case a donor who did not know he had had malaria, and had left the region of endemic malaria in 1924, infected a recipient in 1931.

The facts make it clear that anyone who has resided in regions in which malaria is endemic is a potential carrier of the parasites, and that the use

of such persons as donors is fraught with risk to the recipient. The reaction of Henry is still in the experimental stage, and until some reliable means of identifying latent infection is available it seems advisable not to use donors who have lived in districts where malaria is endemic.

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Clinical and Laboratory Notes

TECHNIQUE OF VARICOSE VEIN INJECTIONS

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AFTER surveying large numbers of patients who have had varicose vein injections, I am convinced that unsatisfactory results are chiefly due to bad technique. I have come to the conclusion that the majority of varicose vein injections are still given with the patient standing, because it is easier to introduce the needle in this position. Colt, Ramsay, and Morrison,¹ however, say that when one hears of patients with enormous varices being injected in the standing or sitting position it is evident that there is a lack of appreciation of the principles concerned. I would like to go further than this by condemning all varicose vein injections given in the standing position, and I will describe a satisfactory "empty vein" technique that can be used in all cases.

DISADVANTAGES OF INJECTIONS INTO DISTENDED VEINS

The first disadvantage of the standing position is the dilution of the sclerosing solution with the large amount of blood in the vein. This point has often been raised, but many still think that this can be overcome by using larger amounts of stronger sclerosing solutions; this is apt to be followed by a very severe localised reaction. The other disadvantages of injections into distended veins result from the high venous pressure; I do not think this point has been sufficiently emphasised. The high venous pressure causes extravasation of the sclerosing solution into the perivenous tissues, and often causes a perivenous cellulitis at the site of the injection; it has even caused an injection ulcer,² although the injection was given intravenously. A varicose vein already has impaired elasticity, and also probably excessive permeability of its endothelium; it is rational to assume that the venules of the vasa vasorum are also dilated and more permeable. In the injection treatment it is therefore advisable to assist the contraction of the vein as much as possible, in order to obtain the "stiction" effect, and yet to

avoid excessive reactions and liability to necrosis of the vein. These desirable effects have been found to be best produced by using an empty vein technique.

EMPTYING THE VEIN

Without an Esmarch's bandage it is impossible to produce an absolutely empty vein, but the more the limb is elevated the more empty do the veins become, and the degree of emptiness produced by this method is sufficient.

Attempts have been made to empty veins by complicated apparatus. Schmitt³ used a double-barrelled syringe, after placing a proximal and distal tourniquet on the segment of the vein to be injected. He "emptied" the vein with one syringe, and injected the sclerosing solution with the other. Nobl⁴ also used two constricting bands on the limb. The difficulty, however, lies in the presence of communicating veins, which allow a superficial vein to fill although it is occluded at both ends. Colt⁵ has mentioned that during varicose vein operations, bleeding occurs from the communicating veins: these operations were performed with the leg horizontal or slightly elevated, so more elevation is required to stop the flow.

Steubner⁶ realised how important it was not to inject a varicose vein with the patient standing, although he used the erect posture for the needle insertion; he devised accordingly a special table to enable the change in posture to be made. His method has serious drawbacks. First, it involves cumbersome apparatus and is therefore unlikely to be widely accepted; secondly, the needle may slip out during the change in position; and thirdly, the limb can only be elevated to the horizontal position.

TECHNIQUE

Having decided that a well-elevated limb is best for injection, it is necessary to have a simple, certain method of producing at first a distended vein for the introduction of the needle, and then a collapsed vein for the injection, with the limb elevated the whole time so that there is no change in position. The basis of the technique is that a pneumatic tourniquet, inflated to a pressure of 180 mm. Hg, is sufficient to occlude all the veins of the lower limb, including the deep ones, so that the superficial veins remain distended when the leg is well elevated.

An ordinary sphygmomanometer is placed on the lower third of the thigh with the patient standing, chiefly on the other foot so that the thigh muscles are relaxed, and the tourniquet is inflated to 180 mm. Hg pressure. He then lies down on a couch, with his chest slightly supported, and the affected leg is raised on a box. The first injection is given at the periphery. When the distended vein has been entered, the pressure in the tourniquet is easily released with the left hand. Before injecting the solution it is advisable to wait until the veins visibly collapse. When the needle is withdrawn it is usual to apply temporary pressure, but it will be observed that the puncture does not bleed as it invariably does when veins are injected in the standing or even horizontal position. The limb should remain raised until an Elastoplast bandage has been applied.

I have found, like many others,¹ that 30 per cent. sodium salicylate solution is the most reliable of the common sclerosing agents, while the very few refractory cases invariably respond to 10 per cent. sodium morrhuate.

RESULTS OF TREATMENT

By this technique the number of injections required to cure a patient has been much diminished, although the dose of 30 per cent. sodium salicylate has been

4-5 c.cm. for an average case. Excessive reactions have, however, been more infrequent and trouble at the site of the injection has become unknown.

By comparing similar cases, I think that injections starting at the periphery with this technique yield better results than internal saphenous vein ligation followed by injections. A cramp-like pain in the leg after salicylate injections is the only real disadvantage, but this is not severe enough to discontinue its use until the discovery of another solution that is painless and as reliable. Fainting occurred in two patients immediately after injection, but an excessive dose was given in one and probably also in the other; both patients were quite fit within five minutes, and they both obtained excellent results. If the injector is afraid of the solution entering the general circulation, and he wishes to use larger doses of solution, the tourniquet can be again quickly inflated to 180 mm. Hg pressure as soon as the veins have collapsed, so that the sclerosing solution is loculated in the veins; this addition to the technique is only required for the largest veins. Slow-injection is apparently a sufficient safeguard in the majority of patients, if moderate doses are given.

SUMMARY

(1) The advantages of an "empty vein" technique are stressed. (2) A simple effective technique is described, which I hope will be useful to a wider circle of vein injectors.

I wish to thank the staff of the Liverpool Royal Infirmary for permission to treat their cases, and the successive house surgeons, who have also carried out the technique in a large number of cases.

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RUPTURE OF UTERUS WITHOUT SYMPTOMS

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IN the following case a woman carried on her normal occupation of housewife for six weeks after rupture of the uterus.

Mrs. B., aged 39 years. It was her seventh pregnancy; five children had been born alive and there had been one miscarriage. The fifth child was delivered by Caesarean section, which was performed for central placenta praevia on Nov. 23rd, 1929. The last menstrual period in the seventh pregnancy began on March 10th, 1935. The estimated date of birth was, therefore, Dec. 18th-20th, 1935, but no child was then born; some pains were felt, actually between these dates, but they were not very marked and they passed off again. There was no dilatation of the cervix and it was thought by her doctor that there had been a mistake about the dates, as the uterus did not appear to have reached the size of a full term pregnancy. The woman remained at her work as a housewife and was first seen by me on Jan. 30th, 1936, as it was now considered that there was a possibility of post-maturity, even if there had been a mistake of a month in the dates.

On examination the patient did not seem to be in any way unwell. Temperature, 98° F.; pulse, 84; blood pressure, 134/76 mm. Hg. Abdominal examination revealed a pregnancy, by size about 34-36 weeks, and

there was some tenderness on palpation. The foetus was in the right sacro-anterior breech position. No fetal movements were observed and no fetal heart sounds could be heard. On vaginal examination there was a slight reddish-brown sanious discharge, said to have been present since Dec. 20th. The cervix was small and firm; there was no dilatation. No presenting part of the foetus could be felt, and no definite opinion as to the condition of the body of the uterus could be formed owing to tenderness and rigidity.

The patient was removed to hospital with a view to further investigation and termination of the pregnancy. No satisfactory evidence could be obtained of the previous Caesarean section, but questions to the patient elicited the fact that the puerperium had been complicated and followed by severe illness. Examination of the urine showed specific gravity 1030. No albumin or other abnormality.

X ray examination confirmed the presence of a foetus; the report was as follows: presence of foetus, skull collapsed.

In view of the history it was decided to operate to remove the foetus and if necessary the uterus.

At operation.—The abdomen was opened by Mr. A. B. Beresford-Jones by a subumbilical midline incision. On opening the peritoneal cavity the foetus was found to be lying free and was removed: the lie was transverse with the head towards the left. The intestines were matted with vernix caseosa. The uterus was about the normal size in a multipara; there was a long rent in the anterior wall of the uterus which was removed by total hysterectomy. There was no blood or organised blood-clot in the peritoneal cavity. The peritoneum was sutured over the

vaginal stump and a drainage-tube stitched into the vagina. The abdomen was closed without drainage.

Progress.—After a brief rise of temperature to 100.4° F., on the day following the operation, the patient made an uninterrupted recovery and was discharged in good health.

Examination of foetus and placenta.—The foetus was macerated and covered with vernix caseosa. The fingernails were fully developed and it therefore appeared to be a full term pregnancy; the weight was 4 lb. The placenta was found lightly adherent to the uterus, near the ruptured scar. It was shrunken and thin, 4½ in. in diameter; the total weight with umbilical cord was 7 oz. There was no sign of an extra-uterine attachment.

The uterus had undergone complete involution. There was a rent in the anterior wall, presumably through the scar of the previous Caesarean section, about three-quarters of the whole length.

In my opinion labour occurred between Dec. 18th and 20th, 1935. During this the uterus ruptured through the old Caesarean scar and expelled the foetus and placenta into the peritoneal cavity. This is verified by the condition of the uterus, placenta, and foetus as well as by the progress of the case as described above. Six weeks later the woman was apparently in normal health, with normal temperature and pulse-rate. She had complained only of slight abdominal discomfort and an intermittent blood-stained discharge. There was no evidence that she had suffered from hæmorrhage or shock and she made a complete recovery from the operation.

SPONTANEOUS SUBLUXATION OF THE ATLANTO-AXIAL JOINT

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THIS condition still seems to be of sufficient rarity to report, for I believe only about 25 cases have been placed on record.

Case-history.—The patient was a girl, aged 10, admitted to the Sheffield Royal Hospital on August 4th, 1934, complaining of "stiffness of the neck." She had been perfectly healthy until February, 1934, when during confinement to bed for an attack of acute tonsillitis she

developed stiffness of the neck—a condition which had been slowly becoming worse ever since.

Examination.—Positive findings were: head held forward and to the left, also slightly downward, but can be turned to the right with an effort; no tenderness, muscle wasting, or spasm, no glands or tumour felt; limitation of movement of the head upon the shoulders in all directions. Radiography on August 8th showed displacement of the first cervical vertebra on the second (Fig. 1).

Treatment.—For two months the child was kept lying flat with extension applied; afterwards she was sent home with a Jones's collar which was worn for five months. When she was seen on Sept. 27th, 1935, there was no deformity or limitation of movement and she was in perfect health. Radiograms showed satisfactory reduction and calcification (Fig. 2).

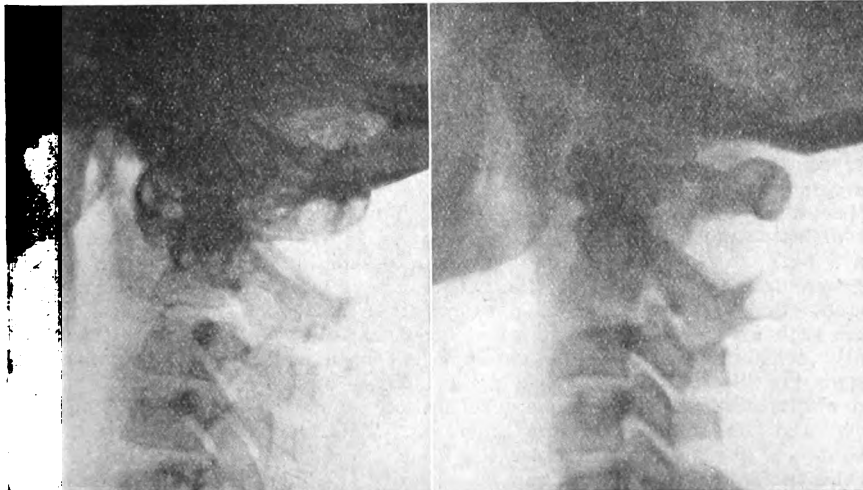
Watson Jones¹ points out that the condition is due to hyperæmic decalcification of the atlas, with loosening of the ligaments attaching the odontoid process to the atlas, consequent upon nasopharyngeal or other infection at the base of the skull. Clinically three groups are met with: (1) dislocation with pressure on the medulla causing immediate death; (2) subluxation with pressure on the cord giving rise to quadriplegia; and (3) the common group of which the above is a typical example.

I wish to thank Mr. J. B. Ferguson Wilson for allowing me to report the case and Dr. J. L. Grout for the radiograms.

¹ Brit. Jour. Surg., 1934, xvi., 30.

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2



8.viii.34.

27.ix.35

FIG. 1.—Displacement of first cervical vertebra over the second.

FIG. 2.—Reduction of deformity

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF MEDICINE

At a meeting of this section held on Feb. 25th the chair was taken by Dr. H. MORLEY FLETCHER, vice-president. Dr. G. W. PICKERING opened a discussion on

Obliterative Arterial Disease

as it affects the limbs. The chief clinical types, he said, were thrombo-angiitis, degenerative, senile, and diabetic forms, and embolism—which all affected arteries of any size and caused loss of pulse. Raynaud's disease with necrosis affected small arteries. All these forms except embolism were progressive, but a sudden single attack might occur in small arteries at the extremities in the bilateral gangrene of the young, of the aged, or of paroxysmal hæmoglobinuria. The term "Raynaud's disease" should be restricted to the spasmodic type due to over-reaction to cold in small limb vessels. In severe cases the vessels became progressively obliterated. The outstanding problem was the nature of the factors determining the oblitative process. Only in the vascular complications of cervical rib could the process certainly be arrested. There was no evidence that any form of treatment materially influenced the course of the disease in other types. The condition could be recognised by intermittent claudication: a constant, aching pain felt in a muscle, induced by exercise and nothing else, and relieved by rest. This pain was due to the accumulation of chemical substances which normally were removed by the circulating blood, and might appear in severe anæmia, but otherwise was pathognomonic of structural disease of the vessels. Other diagnostic indications were gangrene (which, in the absence of physical chemical or mechanical destructive agents, was also an absolute indication), absence of arterial pulsation in a warm limb, skin temperature, and the reactive hyperæmia test. The skin temperature was first measured under ordinary environmental conditions, and in oblitative vascular disease the affected limb was cooler than the other. This, however, might be found in other conditions, including hysteria. Any disused limb was likely to be cold. The temperature was measured again after removal of vasomotor tone by spinal or sympathetic nerve block or by warming the body. A difference of several degrees might then be found between the two limbs, and a typical curve was pathognomonic if there were no indication of interference with the sympathetic nervous system. With a little practice a very fair estimate of skin temperature could be made with the hand. The reactive hyperæmia test was in many ways the best, being delicate and simple. The limb was first warmed in a bath, raised to let the blood flow out, and the circulation abruptly stopped with a sphygmomanometer cuff. Then the limb was kept warm in the bath for about five minutes and the cuff abruptly released. In the normal limb or one with spasm the blood flowed rapidly back to the skin. In oblitative vascular disease the skin just below the cuff flushed in three or four seconds; about ten seconds later blood might creep into the calf, and finally, but slowly, to the digits. The test gave an indication of the lowest level for amputation. The blood-flow could be increased by sympathectomy, which was the only

permanent method; by vasodilator drugs and heat—which were disappointing; by warming the body; and by suction and pressure therapy. Heating a limb increased metabolism and so might increase blood-need more than blood-flow. Suction and pressure applied alternately seemed to be a promising measure. It gave less satisfactory results in the presence of extreme occlusion, massive gangrene or slough, severe infection or dermatophytosis, and osteomyelitis. The only contra-indications were encapsulated pus and severe infection. The main place of temporary measures lay in tiding over the time between obliteration and the opening up of collateral vessels.

THE SURGEON'S CONTRIBUTION

Prof. J. PATERSON ROSS described experience with this condition at St. Bartholomew's Hospital. The symptoms were different according to whether the obliteration was in the terminal vessels or higher up. In the former case the chief symptoms were pain and gangrene. If the pulse were absent in the dorsalis pedis and posterior tibial arteries the case was usually one of diffuse arterial disease with accompanying obliteration higher up—notably in senile and some diabetic patients. The only treatment was amputation above the knee. When the pulses were present it was a little difficult to understand the lesion. Some of the patients were diabetics. Sometimes there was disease of the popliteal artery insufficient to obliterate it. Surgery should be avoided as long as possible in these cases where only a single toe was affected, and should be as conservative as possible. The pain was sometimes present before gangrene and was an expression of poor nutrition in the skin and subcutaneous tissues. It was relieved by anything which improved nutrition. Sympathetic ganglionectomy was usually successful. Obliteration of the main vessels was associated with intermittent claudication and severe pain in the leg. Lumbar ganglionectomy for claudication gave disappointing results. The pain in the calf might be dramatically sudden in onset and might appear after an apparently successful ganglionectomy. The removal of a thrombosed portion of the artery had been known to relieve it. Arteriography had given accurate information about the vessels, notably in showing the frequency of atheroma in the popliteal artery.

Mr. A. M. BOYD showed a series of arteriograms illustrating the help given by this method. Localised disease of the popliteal artery, he said, could be discovered by no other means.

THE PATHOGENESIS

Prof. H. M. TURNBULL reported on 112 amputations for gangrene, 95 having been done for atheroma and 17 for thrombo-angiitis obliterans. The majority of the atheroma cases had been associated with medial calcification and a few with medial fibrosis. There had been nearly 40 per cent. females, and all the patients had been aged. In the intima there was a great increase of the hyperplastic layer, and some degeneration—sometimes calcification but often fatty atheroma. This increase of the intima could reduce the lumen to a small canal and form a sort of new vessel round it. That alone was often enough to produce gangrene. Total occlusion might be produced by fatty atheroma: imbibition of the intima with lipid. A commoner way was organisation of

a thrombus. The condition was so widespread that a collateral circulation seemed almost impossible; no healthy arteries were available. In thromboangiitis obliterans males were in the great majority; the average age was much younger (31-56), and often the patients were diabetic. There had been no necropsy in this series, and the study of amputated limbs was unsatisfactory. It appeared, however, that the obliteration by organised thrombus began in small arteries and proceeded towards the heart. There was always evidence of inflammation, but this did not imply that inflammation preceded thrombosis. There had been little or no evidence of adventitia inflammation or of intimal cushions as a basis for thrombosis in smaller arteries. In larger vessels the intima showed thickening, vascularity, and a delicate collagenous stroma—an extension of the inflammatory reaction organising the clot. It also showed in most cases large areas of hypertrophy in the popliteal artery and its branches, forming great cushions, but this process did not, probably, give rise to thrombosis by itself. The cushions were degenerate areas of hypertrophied intima, probably formed secondarily to obstruction in the smaller arteries. In two cases there had been endarteritis fibrosa, but no associated thrombosis. The veins showed a focal or general intimal hypertrophy, but that might be an adaptation to a reduced flow and was also seen in the smallest arteries.

DISCUSSION

Dr. PARKES WEBER said that the causes of thromboangiitis obliterans were not known. A constant problem was whether or not to stop all use of tobacco; it seemed that smoking played a part and absolute abstinence at an early stage might just make the difference.

Dr. OTTO LEYTON found it hard to believe that gangrene was never due to spasm, and quoted a case where spasmodic gangrene had occurred in a diabetic. He recalled successful Symes' amputations for gangrene of the toes, although at the operations no ligatures had been necessary. He doubted whether a pulse were always lost before intermittent claudication.

Dr. J. D. ROLLESTON referred to the rare cases of obliterative disease after infectious fevers. Gangrene of the leg had followed diphtheria in two cases, and fatal double gangrene of the legs had followed measles once in his experience.

SECTION OF UROLOGY

At a meeting of this section on Feb. 27th, with Mr. R. OGIER WARD, the president, in the chair, a paper on

Horseshoe Kidney

was read by Mr. R. H. O. B. ROBINSON. He said that the incidence of horseshoe kidney in cases of renal disease was 1 in 125. Male patients preponderated over females in the proportion of 8 to 3. The U-shaped mass lay lower than the usual kidney level, and the pelves lay anteriorly because normal rotation could not occur. The mass was heavier than two normal kidneys. Lower pole fusion was commoner than upper pole fusion. In upper pole fusion the suprarenals might also be fused, and this should be borne in mind if extirpation of a part of the kidney was contemplated. There was usually one artery to each half, and one artery to the isthmus. Radiographically the lower renal poles were invisible, the pelves low, and the inferior calices on one or

both sides lay internal to the ureter. The minimal basal angle ranged from 60°-90° in the normal radiogram, with an average of 90°. In horseshoe kidney it was reduced, and in his series averaged 57°. The ureters showed a "flower vase" arrangement, each having a slight S-shaped bend so that together they outlined the contours of a vase. Mr. Robinson showed a series of radiograms of the condition, in which the pelves were seen to be low, often elongated, and bizarre in shape, and the reduction of the minimum basal angle was demonstrated. The complications, he said, were obstruction to outflow of urine, with the development of hydronephrosis and pyonephrosis or calculi; or the horseshoe, like the normal kidney, might be involved by tuberculosis or tumour formation. The condition required no treatment per se. In Thompson's 19 cases only 3 showed renal disease. Pain was a fairly common symptom. Abdominal tumour was not a prominent physical sign; statistics showed its presence in 30 per cent. of cases. In performing heminephrectomy the first step was to tap a hydronephrosis or remove calculi if present. Later the kidney could be approached extraperitoneally from the lateral position and the isthmus divided between clamps. Horseshoe kidney was probably comparatively common and could be diagnosed by routine pyelography.

In the discussion which followed, Mr. A. RALPH THOMPSON said that in some cases unilateral kidney was really a variety of horseshoe kidney. In the latter condition the fused kidney level prevented from rising to the normal kidney level by the inferior mesenteric artery; if it did succeed in rising it was forced to go to the left side, and then had the form of a solitary kidney with two ureters. He thought the term "fused kidney," which covered this condition, should be preferred to "horseshoe kidney" which did not.

Mr. F. MCG. LOUGHNANE described a case in which he had divided the isthmus of a horseshoe kidney through a right loin incision, and fixed the right kidney but not the left by nephropexy. Subsequently there was leakage of urine from the right kidney through the wound; this was eventually stopped by diathermising the sinus. He now considered that a second incision should always be made in these cases in order to fix the left kidney as well as the right lest leakage of urine from the left kidney into the tissues should occur and cause disaster.

Mr. H. A. M. WHITBY described a case in which it had been necessary to remove the left half of a horseshoe kidney in a youth of 17; the patient had died of peritonitis on the eighth day.

Sir W. DE COURCY WHEELER had performed heminephrectomy of a tuberculous horseshoe kidney, the anatomical condition being recognised during the operation.

Mr. JOHN EVERIDGE had seen two cases of ruptured horseshoe kidney in one month, and in both he had sutured the ruptures and avoided heminephrectomy. Rupture was probably not an uncommon accident to a horseshoe kidney; a jar on the abdomen might be sufficient to cause it, because the kidneys were fixed by the isthmus. He thought it would be wise nowadays to divide the bridge by endothermy to avoid hæmorrhage.

Mr. T. J. MILLIN contributed a paper on the Surgical Treatment of Impotence

He said that inability to produce erection might be due to: (1) congenital or acquired abnormalities of the external genitalia; (2) systemic disease; (3) neuro-

pathies; (4) endocrine disorders; (5) neurasthenia; (6) functional causes; or (7) it might be transitory as a result of prolonged abstinence. Three other conditions might be responsible for the disability—namely, trauma of the perineum, inflammation of the perineum, and premature senility (occurring between 40 and 50 years of age). Physiologically erection depended on either psycho-sensorial or cutaneo-motor reflexes, and involved cerebral, lumbar, and sacral nerve centres. Lowsley in New York had experimented by ablation and by plication of the bulbo- and ischio-cavernosus muscles in dogs, and had found that the power of erection was considerably influenced by the action of these muscles. He had then tried the effect plicating these muscles in man. The operation was performed with the patient in the lithotomy position and a bougie was passed into the urethra. The bulbo-cavernosi muscles were plicated and the ischio-cavernosi approximated towards the midline by means of ligatures of chromicised ribbon catgut. In Lowsley's series complete success had followed the operation in 9 cases of 14. In his own series of 8 cases there were 4 complete and 2 partial successes. The cases should be selected and those with a neuropathic history excluded.

Mr. A. E. ROCHE described a case of impotence following rupture of the urethra in which the disability had possibly been of psychological origin.

Mr. WHITBY recalled a patient who had been impotent for 15 years following rupture of the membranous urethra by a shell wound during the war. He had treated this man by diathermy to the spine and rectum, orchitic injections, and suprarenal extract. After two years erection had been re-established.

Mr. THOMPSON quoted cases illustrating that epispadias and hypospadias were not necessarily associated with impotence.

Mr. V. W. DIX wanted to know whether the four successful cases in Mr. Millin's series had been exposed, before operative treatment, to the vigorous influence of Mr. Millin's personality.

Mr. MILLIN replied that the two cases he had treated before operation had both been failures.

The PRESIDENT said he had seen some of Lowsley's work in New York, and believed that Lowsley claimed that the operation was only useful in cases where there was impotence due to injury of the perineum.

A discussion on

Steinach II. Operation for Prostatic Obstruction

was opened by Mr. A. ELLIOT-SMITH, who said that that this operation consisted in bilateral ligation of the efferent ducts of the testicle as they passed to the globus major of the epididymis. Ligation of the vas deferens (Steinach I.) was liable to produce swelling and tenderness of the epididymis, from collection of testicular secretions. The Steinach II. operation occluded the testicular ducts before they reached the epididymis, and the tunica albuginea prevented undue swelling of the body of the testicle. Dr. Paul Niehans, of Clarens, was the first to use this operation for prostatic obstruction.¹ Local anaesthesia was used and a silk ligature was passed round the digital fossa of the epididymis so as to occupy the groove between the globus major and the body of the testicle. Mr. Elliot-Smith had himself performed the operation on 20 cases, but had lost sight of 2 after two and three months respectively.

¹ See THE LANCET, Feb. 8th, 1936, p. 307.

Of the remaining 18 patients, 3 had died and 15 had left hospital with fairly good control of micturition; 2, however, had had a recurrence of prostatic obstruction 8–10 months later and had been treated by prostatectomy. Sixteen patients in the series had been admitted with acute retention, and of these 9 had had persistent retention over periods varying from ten days to five weeks; 5 of these passed urine normally on the day of the operation and the other 4 passed urine on the second, fourth, seventh, and thirteenth day respectively. Two patients in the series were admitted with suprapubic cystostomies. Although normal micturition might begin soon after the operation, it was quite usual for the residual urine to exceed the amount passed naturally for the first week. In the absence of infection, the residual urine of his cases had come down to 1 or 2 oz. over periods varying from one week to five. Difficulty in starting the act of micturition seemed to be abolished once normal micturition had begun. Some degree of frequency might persist. Having examined his old cases, he was convinced that there was a definite decrease in the size of the gland following operation. Thirteen cases in his series of 18 had been relieved by the operation and were still under observation, the periods since operation ranging from one month to eighteen.

Mr. H. P. WINSBURY WHITE described a case in which the residual urine had amounted to 18 oz. on the day before operation. Following the operation the patient developed acute retention leading to uraemia. A catheter had been tied in until he had passed the crisis, and the residual urine was now down to 4 oz. and the patient was progressing favourably.

Prof. G. GREY TURNER had seen Mr. Elliot-Smith's cases and had been much impressed. He thought the method deserved thorough trial.—Mr. A. CLIFFORD MORSON asked what was the pathological nature of the prostatic obstruction treated by Mr. Elliot-Smith.

Mr. DIX asked whether there was any advantage in Steinach II. over the Steinach I. operation, in which the vas deferens was ligatured or a part of it was excised. Did ligation of the vas really cause any tenderness of the head of the epididymis?

Mr. EVERIDGE said that patients with incipient prostatic symptoms were beginning to make inquiries about this operation. Some investigation was necessary to find out whether operation on these younger patients was desirable.

Mr. J. G. YATES BELL said that many surgeons ligatured the vas before performing suprapubic cystostomy, as a safeguard against epididymitis. If there was no danger of such infection occurring, Steinach II. might be adopted instead of Steinach I. as a preliminary to the operation.

Mr. JACOBS said he thought that Steinach II. was not suitable in all cases of prostatic obstruction, and described a case in which there had been improvement in frequency following the operation, but in which the residual urine had increased in amount, and suprapubic cystostomy had become necessary owing to the onset of uraemic symptoms.

Mr. S. I. LEVY mentioned two patients who had become more vigorous and active following Steinach II. operations, and also, according to the nurses, younger looking. On the other hand, a patient of 80, on whom he had operated the day before, was now seeing elephants and robbers.

Mr. LOUGHNANE asked what was the effect of the operation on kidney function, and Mr.

E. W. RICHES reminded the meeting that cases of prostatic obstruction often showed fluctuation of symptoms. After an attack of acute retention a patient might remain well for years. The renal function should be thoroughly investigated before and after the operation.

Mr. ROCHE suggested that both Steinach I. and II. might be performed as a preliminary to the suprapubic operation.—Dr. HEY remarked that Dr. Niehans claimed that Steinach II. was advantageous in cases of carcinoma of the prostate.

In replying, Mr. ELLIOT-SMITH said that spermatogenesis was believed to be diminished by Steinach II., and that this gave it an advantage over Steinach I. He had seen no epididymitis in his cases but agreed that both operations might be done as a safeguard before a suprapubic cystostomy. He had noticed no mental changes in his patients. All the prostates in his series were large, not small and fibrous. Two, removed post mortem from patients who died, showed a decrease of epithelium and an abundance of the fibrous elements.

MEDICO-LEGAL SOCIETY

At the meeting of the society held at Manson House, Portland-place, on Feb. 27th, Mr. C. AINSWORTH MITCHELL, D.Sc., the president, being in the chair, Mr. H. W. LINSTAD read a paper on

Statutory Safeguards against Poisoning

with special reference to the work of the Poisons Board. He said that according to the Registrar-General's report 892 persons died in Great Britain from poisoning in 1934, the average annual number for the last ten years having been 815. He proposed to indicate some of the causes of those deaths, the statutory safeguards provided in the Pharmacy and Poisons Act, 1933, and the recently made rules. Hitherto the duty of deciding what substances should be subjected to statutory control had been vested in the Council of the Pharmaceutical Society, and a Departmental Committee, reporting in 1926, testified to its honourable and distinguished service. But it was thought undesirable that such an important duty should be carried out otherwise than by a Minister responsible to Parliament. The Home Secretary was advised on the rules to be made under the Act by the Poisons Board, who had also prepared the Poisons List. The List and Rules were now before Parliament.

Misuse of poisons, said Mr. Linstead, was classifiable under the three headings: suicide, accident, criminal poisoning other than suicide.

The extent to which *suicide* could be prevented depended on whether it was premeditated or committed because of means readily at hand to carry out a sudden impulse. The Departmental Committee had endeavoured to ascertain whether the easy accessibility of coal-gas caused persons to commit suicide who would not otherwise have done so. In favour of this supposition was the considerable increase of the rate of suicide among females of recent years, the increase being entirely in coal-gas deaths. The Committee were agreed, at any rate, that the publicity given to cases of suicide by poisoning had been the cause of the adoption of this means through suggestion and imitation, and therefore recommended a drastic statutory limitation of the publicity given in newspapers to inquests on suicides.

Apart from coal-gas, lysol and hydrochloric acid were most commonly used by suicides in the proportion respectively of 1000, 300, and 90 per year. There were now available less toxic substitutes for the two latter substances: halogenated phenols were coming into use as disinfectants, and non-toxic powders for domestic purposes. It was therefore regrettable that the Home Secretary, against the recommendations of the Poisons Board, had permitted both lysol and hydrochloric acid to be sold by any trader who successfully applied to the local authority to have his name added to the list of poison sellers. Though aspirin had been used as a means of suicide the evidence as to its danger did not seem to warrant the scheduling of this drug as a poison. The Poisons Board had directed attention to the need for greater control over the derivatives of barbituric acid. Each of the many analogues of Veronal had been termed the safe hypnotic, yet each in turn found its way into the statistics of deaths from poisoning. Though fatalities from this group of drugs had increased during recent years the total number was not yet large. For the tighter control of these drugs the new legislation provided that they should be supplied to the public upon medical, dental, or veterinary prescription only, the prescription being valid for one occasion only, unless the prescriber ordered repetition. The new legislation contained few provisions which were likely seriously to decrease the use of poison for suicide, and the greater availability of lysol might be reflected in an increase in the suicide figures from this poison in the coming years.

Accidents were liable to occur wherever poisons were used. For example, halogenated derivatives of carbon, such as carbon tetrachloride and di- and tri-chlorethylene, both widely used as industrial solvents, might have toxic effects. Continual inhalation of these vapours caused toxic jaundice. The Poisons Board had suggested that it might be desirable to require the labelling of the containers of these substances with a warning of the character of the contents, and the precautions to be taken in using. The manufacture of pharmaceutical preparations containing poisons had nowadays to be undertaken by or under the supervision of a pharmacist, a member of the Institute of Chemistry, or a person who for a period of three years before the Rules came into operation had been continuously engaged in the manufacture of such preparations. Certain biological products were allowed to be manufactured by or under the supervision of a medical practitioner. In the past, accidents had occurred due to the sale of such substances as solutions of ammonia, hydrochloric acid, and disinfectants in sauce bottles, whisky bottles, and even milk jugs by traders who kept no poison bottles; this led the Poisons Board to recommend that listed sellers of Part II. poisons should be required to sell those poisons in sealed containers as sealed by the manufacturer. However, the value of this recommendation had been weakened by a modification permitting solutions of ammonia, hydrochloric acid, and salts of lemon to be packed by the listed seller.

The compounding of medicine containing poison was restricted to hospitals, pharmacies, and medical practitioners' establishments. Any person, however small his pharmaceutical knowledge, was allowed to open a shop and undertake the dispensing of medical prescriptions. Nor had we in this country, said Mr. Linstead, adopted the precaution against accidents which existed in most countries on the continent, the reservation to the medical

practitioner of prescribing and to the pharmacist of dispensing. In Scotland there was a convention whereby the medical practitioner did not supply his own medicines. Little could be done by legislation to prevent accidents from poisons occurring in the home; except by labelling and a distinctive shape of a bottle containing poison. The too frequent use of the word "poison," particularly when applied to substances not highly toxic, diminished the cautionary value of the word. For medicine to be taken internally the following words might be substituted: "Caution; it is dangerous to exceed the stated dose." Mr. Linstead quoted one case in which a poison was bought in a poison bottle, but was turned into a milk jug so that the bottle could be returned and the deposit refunded. In another case a fowl was destroyed by strychnine in order to destroy a neighbouring fox; but a farm labourer found the fowl and took it home for the family dinner. The carrying of poisons by railway was carefully regulated to prevent leakage, but, so far, no parallel regulations had existed for carriage by road. Rules to fill this gap had now been made. No general provision was found to be practicable for the more ready identification of poisons.

Two circumstances contributed to accidental poisoning from substances designed for medical purposes, perhaps on medical advice: (1) the idiosyncrasy of individual patients, and (2) the taking for long periods of poisons which had a cumulative effect. The Board had to consider a number of poisons which were known to have caused death or serious impairment of health when taken in medicinal doses. The effect of regular ingestion of acetanilide in producing toxic jaundice had long been recognised, and its use as an ingredient in proprietary medicines had now been checked by including it in Part I. of the Poisons List. Attention was also directed to the part played by pyramidon in producing agranulocytic angina; the Board had imposed a restriction limiting the supply of this drug to a medical prescription, so barring its use in proprietary medicines. The nitrophenols and nitrocresols were liable to produce untoward results, even in medicinal doses, unless the basal metabolic rate of the patient was regularly determined. At least one death had occurred in this country from using such a preparation for slimming purposes. Under the Poisons Rules these preparations might be supplied to the public upon medical prescription only, and steps had been taken to acquaint practitioners with the precautions necessary in the administration of these drugs.

Turning to the use of poisons for *criminal purposes*, Mr. Linstead said that one of the principal objects of the new legislation, as of the old, was to prevent the use of poison for murder, or, at the worst, to facilitate the detection of the murderer. It sought to do this by making the poison difficult to obtain, and the transaction easier to trace by means of a record kept by the seller, and by the label placed on the container. Such poisons as arsenious oxide were now surrounded by numerous restrictions. The registration of all pharmacies by the Pharmaceutical Society and the listing of premises of sellers of Part II. poisons by local authorities would do much to facilitate the task of the police in tracing the supply of a poison by circumscribing the scope of their inquiries. The progressive increase in the delicacy of methods of chemical analysis rendered it very difficult now for a poison used for crime to escape detection. Among the legal aspects of the question was a substantial increase in penalties,

though the maximum fines imposed were not excessive in comparison with those prescribed in similar modern statutes. The rule-making powers conferred upon the Secretary of State by Section 23 of the Pharmacy and Poisons Act, 1933, were very wide, and were such as to discourage any except the most enthusiastic litigant from taking a case to appeal, since any decision could soon be invalidated by a modification in the rules.

DISCUSSION

Sir WILLIAM WILLCOX said that the report of the Poisons Board represented an upheaval of the pre-existing conditions, and it remained to be seen how the new enactments would answer in practice. Some difficulties were to be expected at first. The recommendations of the Board had not been followed implicitly, as some of the enactments had been modified by the Home Secretary. He agreed that the possibility of purchasing lysol and hydrochloric acid from a person who knew nothing of poisons was a danger. One of the great steps forward taken by the Board was in placing under control drugs which on account of their toxic action ought to be dispensable by only medical men and pharmacists. Barbiturates had hitherto been easily obtainable, and yet they were undoubtedly drugs of addiction. The ordinary person was not in danger of becoming an addict, but the neurotic and unstable was very liable to do so. A further important point was that the prescription for these drugs would in future be retained by the dispenser; if the patient was allowed to keep the prescription the restrictive clause would be largely cancelled, as he could run round to various chemists with it and so lay in a good stock. If there was need to repeat the dose, the number of repetitions must be stated, and the pharmacist should register the details. Australia several years ago adopted regulations restricting the use of drugs of the veronal group, though so far they had not stipulated that the pharmacist must retain the prescription. Drugs which had received special attention included the atophan group, which caused toxic jaundice. He was glad to know that in future strychnine was to be prohibited for the purpose of destroying animals; it would be interesting to see whether the substitutes for this purpose would prove efficient.

Dr. JUDAH JONA (Melbourne) said that in Australia the pharmacist was not required to retain the prescription containing a dangerous drug but to cancel it with a large-lettered rubber stamp, so that there was no chance of it being repeated without authority. Patients liked to retain it as a memento of the fee paid to the doctor. Though there were safeguards against repetition, there were none against purchasing large quantities at a single time. He suggested that the time had arrived for an "honest advertisement" Act, a matter in which he would like to see Great Britain take the lead.

Mr. R. L. COLLETT, F.I.C., said one of the difficulties in connexion with this legislation was that the substances concerned were important products, apart from being poisons; they were used in industry in large quantities, also in research and in analytical work. The problem of the Poisons Board had been complicated by the difficulty of ensuring adequate protection to the public without imposing excessive restrictions upon industry and the practice of the sciences. His own experience of the leather industry ten years ago was that of seeing men shovel red arsenic into vats of lime and soda with a wooden spade; those substances were lying on the floor

of the tannery. He congratulated the Board on the reasonable spirit with which they had removed noxious restrictions from industry while safeguarding the public. It was easier to get a rule altered if experience showed it was inadvisable than to establish the restriction in the first place.

Mr. H. E. CHAPMAN said a year or two must elapse before it would be known whether the present system of control would be more effective than that previously in force.

Mr. F. BULLOCH, D.Ph., was glad that the Poisons Board and the Home Secretary did not see eye to eye over some of the enactments. The Board recommended that poisons used for animal medicines and sold as proprietary medicines should be limited to a certain series of poisons; but now, through the action of the Home Secretary, that limitation had been suddenly withdrawn and so the whole gamut of poisons was open to animal medicine manufacturers.

Prof. J. G. WRIGHT (Royal Veterinary College) said that no member of the veterinary profession had a seat on the Poisons Board. He congratulated the Board on their decision regarding the use of poisonous substances in vermin beds; he protested against the use of poison baits which had been indiscriminately laid. Dispatching animals by arsenic and phosphorus meant a miserable death. Morphine was largely used by the veterinarian as a pain reliever, as also was cocaine, which drug had such a more sedative action on the dog's cornea than did any other.

The PRESIDENT thought that if the Poisons Board could be invested with more power than at present, many of the existing difficulties would disappear. As an instance, meta fuel, which had been investigated by Sir William Willcox, Dr. Cox, and himself, ought to be labelled as a poison. It was used in the cinema industry for producing an impression of snowstorms, and was sold in small boxes, looking like sweets, which could be purchased by anybody. It had been eaten as a sweet by accident.

Mr. LINSTED, in reply, said an attempt had been made to get over the formula on the bottle difficulty by requiring disclosure of the usual scientific name on the bottle or packet. He had been glad to learn that strychnine was not necessary as a vermin killer.

SOCIETY OF MEDICAL OFFICERS OF HEALTH

THE maternity and child welfare group of this society held a meeting in London on Feb. 21st with Dr. G. C. M. M'GONIGLE (Stockton-on-Tees) in the chair.

Prevention of Maternal Mortality: the Rochdale Experiment

Dr. ANDREW TOPPING (senior medical officer, London County Council; late M.O.H. for Rochdale) read a paper entitled *Some Factors in Maternal Mortality with special reference to the part played by Publicity in its Prevention*. He began by explaining the alarm and dissatisfaction expressed by the public at the continued high maternal mortality-rate as the psychological reaction to the death of a mother in childbirth, and pointed out that there were other conditions—e.g., diphtheria and acute appendicitis—in which lives were lost in an equally unnecessary manner without arousing any comparable public feeling. In the present situation however there were

certain redeeming features, and it should be noted in the first place that the method of reckoning the rate was in several ways fallacious. Clearly the basis of the rate should be the total pregnancies, and since this was not taken as the basis, and varying factors such as the increase in abortion and the decrease in fertility were not comprehended in it, comparisons both with the past and with other countries were misleading. If these considerations were taken into account the place of this country in the international standard of obstetric efficiency would be near the top instead of, as at present, about half-way up. Again, all recent reports had emphasised that about half the maternal deaths were avoidable, but this classification into "avoidability" was unsatisfactory because, for example, the fatal case of eclampsia which had received no antenatal care was classed as an avoidable death, whereas it was well known that eclampsia occasionally might arise despite every precaution. It was also noteworthy that this basis of 50 per cent. of avoidable deaths was largely taken from areas in which the maternal mortality-rate was high. In areas in which the rate was low far less than 50 per cent. were avoidable.

When he had first taken up antenatal work in a metropolitan borough Dr. Topping had been struck by the intense interest taken by pregnant women in their condition, and had found them eager to coöperate if the reasons for their coöperation were intelligently explained. When he moved to Lancashire he found that the health visitors employed by the Lancashire county council were exceedingly good and careful in instructing the mothers in the various practical details of the hygiene of pregnancy and confinement. At Rochdale the maternal mortality-rate was much higher than in the surrounding districts in which the Lancashire health visitors worked, and in fact it had been for some years the highest in England. His first task was to interview the practitioners, many of whom he had come to know personally, and from these he received many suggestions about possible causes of the high rate, such as rickets, malnutrition, and industrial work. A study of the forms of investigation into maternal deaths convinced him, however, that none of these reasons held good and that the two main factors were lack of antenatal care and unnecessary interference.

The first step in the campaign was to hold a meeting of the medical, social, and religious bodies in the area. There was a large attendance, aided perhaps by the provision of a dinner by a generous supporter, and a publicity campaign was decided upon. Numerous meetings were then held averaging about twice weekly, addressed by Dr. Topping himself, his maternity and child welfare medical officer or other doctors. No alarming propaganda was indulged in and it was emphasised that pregnancy was a normal natural condition which was perfectly safe if the mother did her share. Mothers were urged to accept antenatal care, to report the slightest abnormality at once, and to accept in-patient treatment if recommended. They were told that half the maternal deaths were preventable and that the rate in Rochdale could quite easily be lowered. Pamphlets were distributed in which the main causes of death and how to avoid them were simply explained—i.e., disproportion, abnormal presentation, "kidney weakness," and puerperal fever. "Don't listen to grandmother but visit our antenatal clinic and give yourself and your unborn baby a square deal" was the sort of slogan used. The local newspaper

gave valuable help by printing everything submitted by the health department in exactly the form in which it was received and without scare headlines. The local medical and midwives associations coöperated handsomely, and without their help the scheme would have been unworkable.

At the same time certain improvements and enlargements were made in the antenatal clinics. A few criticisms of the work at these clinics were heard, the usual one being that the medical staff of the clinics took no share in the actual confinement. This was dealt with by publicity suggesting that the criticisms would be more valid if their authors performed their antenatal work properly, and the criticism was also partly met by sending a full report of the antenatal examination to the doctor or midwife concerned whether any abnormality was found or not. On the reverse side of the form of report was a space for the details of labour and puerperium to be noted and returned to the public health department. Other steps taken were the appointment of a consultant, the provision of a unit for puerperal sepsis, and the drawing up of plans for a new maternity home. In addition the ten best midwives in the town were guaranteed an income a very little more than their previous average income, and telephones were installed in their houses; this ensured their coöperation, gave them a definite status, and softened their regret if one of their cases was admitted to hospital. Nearly all these measures, said Dr. Topping, had been taken by most boroughs, although sometimes the letter rather than the spirit of the recommendations had been carried out. The only difference in Rochdale lay in the intense propaganda; for example, the mothers quickly came to know what a real antenatal examination connoted and any doctor or midwife who scamped it was very soon talked about very much to his or her disadvantage. Again, the pressure to interfere from the patients and their relatives was enormously reduced and the routine use of forceps fell very greatly.

The publicity campaign was begun in 1931. The average maternal mortality-rate for the four years 1928-31 was 9.0 per thousand; for the four years 1932-35 it was 3.0 per thousand (1.75 in 1935); and it was, therefore, fairly safe to conclude that these results were due to the campaign. Propaganda based on the truth could do nothing but good. The secret was complete honesty: "tell the mothers why they should do what is wanted and they will do it."

FACTORS IN MORTALITY

Responsibility for maternal deaths might lie with any one or more persons—e.g., the patient, the midwife, the doctor, the hospital, or the local authority. As far as the patient is concerned certain factors were not her fault, so to speak, and comparisons between different areas might therefore be fallacious. For example, he had lately been investigating the reasons for the differing rates in the East End and West End of London and had found that the proportion of primigravidae and the age of the first pregnancy were higher in the West End. Another factor was the variation in the illegitimacy rates, it being known that the maternal mortality for illegitimate births was considerably greater than that for legitimate. Again, hospital accommodation clearly varied enormously, and the figures of various hospitals and organisations were not necessarily comparable, largely because of the selection of cases.

As far as the patient was concerned the apportionment of blame was very difficult. The fact of

pregnancy was still often concealed, sometimes because of a false feeling of shame and sometimes because it was hoped that a successful abortion or miscarriage might be managed. The increase of abortion of recent years was very serious; according to a recent article by Dr. Parish of St. Giles's hospital, the number had quadrupled in the last five years. Of 1000 patients admitted (half of whom were infected) 485 admitted instrumental interference, 111 admitted to the use of drugs, and 9 admitted that they had been to a criminal abortionist. He thought that it was not so much poverty as the desire of young couples not to restrict their amusements which was leading to this increase.

Of midwives there were two opposite types which did harm: (1) the kind who thought she knew everything and deprecated bringing in medical assistance even when necessary; and (2) the nervous kind who frightened her patient, sent for the doctor unnecessarily, and urged him to interfere. The problem of the doctor, however, presented the greatest difficulty. The training he received was lamentably inadequate at most schools, and the average man went into practice with no real practical experience. Many were extremely competent, but it was idle to deny that deaths were often directly due to lack of knowledge, errors of judgment, carelessness, hurry, or unwillingness to call in expert assistance. Though there was, and must be, an important place for general practitioners in any midwifery service it must be ensured that all who undertake the work are keen and competent. In spite of everything that so many authorities had said concerning droplet infection it was rare to find a doctor who would wear a mask. Every public health officer who had the task of investigating maternal deaths could quote not one but several cases in which a shocking ignorance or carelessness had apparently been displayed, and one of his councillors had actually proposed that a coroner's inquest should be held on every maternal death. Such a procedure, Dr. Topping thought, would do a great deal of good, but would lead to more trouble than was justified. The consultant, also, might share the responsibility for failure. Some were too prone to interfere unnecessarily; they felt that they had not justified their existence unless they displayed some *tour de force*. Her eagain public knowledge of the facts would be useful, for it would prevent women from thinking that the consultant got his money for nothing if he adopted a policy of masterly inactivity. Many consultants had been remiss in not emphasising the part played by bad midwifery in the causation of maternal deaths.

Finally there were ways in which the voluntary hospital or local authority might fail in their duties. It was freely admitted that some municipal hospitals were not so good as others, but rare to hear any voluntary hospital referred to as anything less than a cross between, say, Guy's and the Edinburgh Royal. But any hospital must be at fault if it purported to deal with maternity cases and fell short of accepted standards. Among local authorities many fulfilled recommendations in the letter, but not in the spirit. Their hospitals, too, might be inadequate; their antenatal clinics might not offer the requisite comfort and privacy, and the experience and qualifications of the medical officer in charge might not command the respect of practitioners. There should be continuity between antenatal and in-patient departments; there should be a self-contained pyrexia unit; the consultant should be an accepted authority,

and practitioners should not be openly or tacitly discouraged from making full use of his services. The medical officer of health was gravely at fault if he did not do his utmost to get his committee to do more than the minimum, and was to be pitied whether blameworthy or not, if his relations with practitioners were not cordial.

DISCUSSION

Dr. E. H. T. NASH (Heston and Isleworth) inquired whether there had been any difference in unemployment over the period in question in Rochdale. He asked because of the remarkable effects of the giving of milk in the Rhondda Valley which were especially evident during a nine months' strike when the women were properly fed for the first time from voluntary sources.

Dr. DUNSTAN BREWER (Swindon) found that even in an area in which the rate was low many deaths were still preventable though, of course, there was an irreducible minimum. He quoted a case in which the urine and blood pressure had been examined at 9 A.M. and found to be normal and the woman was having an eclamptic fit at 4 P.M. As far as statistics were concerned Dr. Brewer thought that the only possible basis was the convention adopted in New South Wales under which every death in a woman between the ages of 15 and 45 is considered to be a maternal death unless proved to the contrary. A scrutiny of all such deaths resulted in the true maternal mortality-rate in his area being always double that returned by the Registrar-General; for example, an inquiry into the death of a young woman from "myocarditis" revealed that a post-mortem had demonstrated a knitting needle in the peritoneum. Such an inquiry was only possible, unfortunately, in the smaller boroughs. The age at primiparity was important as was shown by the recent Canadian report. Dr. Brewer doubted whether the increase in abortions was genuine; might it not be due merely to lessened concealment and increased hospitalisation? On the other hand, he was certain that the art of obstetrics had degenerated in recent years.

The CHAIRMAN (Dr. M'Gonigle) wondered whether a too liberal interpretation of the Central Midwives Board rules for sending for medical aid by midwives was leading to harm through interference in normal cases. In some cases there was undoubtedly dichotomy between midwives and doctors.

In reply, Dr. TOPPING said that the incidence of unemployment had not varied in Rochdale during the period under discussion: in any case it was not the poor mother who died. He too had been impressed by the results of the Rhondda milk experiment, but he understood that a propaganda campaign had been initiated at the same time. His main contention, he said, was that once the true facts were known public opinion would be so strong that improvements would follow in all branches of the service whatever the cost. Undoubtedly, in his opinion, the time had come to speak the truth and shame the devil. Let the blame go where it belonged: to a careless public, an inefficient midwife, an inept doctor, or a badly run health department.

KENT COUNTY OPHTHALMIC AND AURAL HOSPITAL. On Feb. 14th Lady Davis opened the new buildings at this hospital at Maidstone. The president, Sir Edmund Davis, and Mr. E. W. Meyerstein have promised to give £2000 towards the extensions, but there still remains a debt of £3000.

LIVERPOOL MEDICAL INSTITUTION

At a pathological meeting of this institution on Feb. 20th, with Dr. E. GILBERT BARK, vice-president, in the chair, a paper on

Bacteriological Aspects of Puerperal Sepsis

was read by Prof. HEDLEY WRIGHT. The term puerperal fever, he said, was not synonymous with puerperal sepsis in the narrower sense, for in a series of 125 cases of fever in the puerperium it was found that only 48 were due to infection of the genital tract. Of these only 14 were due to hæmolytic streptococci and 10 were attributed to anaerobic streptococci. The occurrence of fever in the puerperium called for full clinical and bacteriological examination of the patient. But severe sepsis was most commonly due to hæmolytic streptococci, although as Colebrook had shown a not inconsiderable proportion of cases was due to anaerobic streptococci. In hæmolytic streptococcal infections blood cultures were negative in some 74 per cent. of cases and where positive the numbers present were usually small (less than one organism per c.cm. to 1000 per c.cm.) according to Hare, and comparable with the numbers found in infective endocarditis and other bacteriæmias. The blood infection was, therefore, to be regarded as a minor feature in the disease. There was sufficient evidence to indicate that the hæmolytic streptococci which caused this condition were not derived from among the normal inhabitants of the genital tract. Where such organisms had been found in the vagina before delivery the puerperium had followed an uneventful course. This was because the normal inhabitants were serologically and biologically distinct from the strains which were pathogenic for man; these fell into one large group which could be subdivided into a large number of types. This particular group had been found almost exclusively in the respiratory tract of normal human beings, the fæces of patients suffering from an infection of the upper respiratory tract, and on the hands of some normal persons. That the respiratory tract was the main source of infection in the puerperium was therefore to be expected, and in 103 cases reported by various authors 99 had actually been traced to such a source, 79 to some person in attendance and 20 to the patient's own throat or nose. Specific treatment with the sera available appeared to be completely useless, and it was possible that this was in part due to the difficulty of obtaining a serum adapted to the particular infecting strain, though more probably to the fact that recovery from infections of this kind was largely influenced by incompletely recognised factors within the local focus of infection in the genital tract.

In the discussion which followed, Dr. H. H. MACWILLIAM said that in the acute and severe cases of puerperal septicæmia there was very little localisation of the infection. He regarded thrombosis in the veins as an important factor in limiting spread. In these acute cases the vessels in the placental site did not show the clotting found in this situation in patients who had died from some other cause. When thrombosis occurred in the iliac veins the prognosis was relatively favourable and it was likely that thrombosis was very much more common in the ovarian veins than is suspected. Antimicrobial serum was useless, but Dr. MacWilliam thought that under certain conditions antitoxic serum, probably by supplying complement, was one of the most effective

agents we possess. Until recently the experience at Walton Hospital, Liverpool, was that if a good growth of hæmolytic streptococci was obtained from the blood in a broth medium by simple technique the patient nearly always died. About two years ago treatment with human serum was adopted, and since then the recovery-rate had been quite high.

MIDLAND MEDICAL SOCIETY

At a meeting of this society held at Birmingham on Feb. 5th, with Prof. W. H. WYNN, the president, in the chair, a paper on

Diverticulitis of the Colon

was read by Prof. SEYMOUR BARLING. He thought the condition was due to weakness at certain points in the bowel between the longitudinal bands, associated with abnormal stresses in the large bowel. This weakness he attributed to previous inflammation. The term "prediverticular state" he considered a misnomer, for he had seen a patient in the so-called prediverticular phase, with four years' symptoms, in whom at laparotomy temporary diverticula could be seen whenever the bowel was in spasm. In such a case diverticula had already formed. Another patient had died of ulcerative colitis, the musculature being involved in inflammation from the mucous membrane; and though the X ray picture was that of the "prediverticular state" no diverticula were present post mortem. There was a type with fibrosis and narrowing of the bowel wall, apparently due to inflammation and fibrosis strengthening instead of weakening the muscle-fibres, the diverticula being apparently incidental in some cases. Diverticulosis—where fully developed diverticula were present—was slowly progressive, but the symptoms were of a minor character and seldom necessitated operation. Cases with secondary infection were the ones usually seen by the surgeon and represented the true diverticulitis; the patients were mostly over 60 and it was the result of slowly progressive changes which might be overlooked in the early stages. Initial pain might be slight or severe; a tender colon might be palpable in the left iliac fossa and occasionally severe hæmorrhage was a sign—it had occurred in 3 cases out of the speaker's series of 28. Obstruction was not uncommon and might occasionally be due to carcinoma superimposed on the diverticular disease. Prof. Barling had had 5 cases with carcinoma out of 28. Early cases required medical treatment and surgery was needed chiefly for obstruction, spreading sepsis, or fistula. The disease was not the surgical curiosity it was considered to be and had to be kept in mind when an abdominal condition presented itself.

Dr. T. L. HARDY asked if any useful purpose was served by the term "diverticulosis." It suggested an active morbid process associated with symptoms, but many authorities did not regard it as such. Diverticula were present in about 5 per cent. of patients over the age of forty, a figure obtained by Rankin and Brown at the Mayo Clinic from 24,620 radiological examinations of the colon and 1925 post-mortem examinations. Whether uncomplicated diverticula ever of themselves gave rise to symptoms was debatable, his own view being that the symptoms complained of at that stage were due to an associated disturbance of bowel function, accidental rather than incidental to the diverticula. Dr. Hardy's personal experience of diverticulitis was, he said, small, and

he had records of only 22 cases (16 men and 6 women) in the past six years. He agreed with Prof. Barling that diverticula were largely manifestations of wear and tear; they showed themselves usually in the degenerative or decreescent period of life, the average age in his series being 58. Of his 22 patients 14 were noted as being obese and flabby. He did not think it need be assumed that spasm played an important part in the formation of diverticula, or that sympathetic or parasympathetic and endocrine influences were necessarily responsible; for neither true colon spasm, a much more common disorder, nor the various forms of colitis led to the formation of diverticula. The dangerous potentialities of diverticula needed no emphasis. According to Rankin, in about 15 per cent. of cases they became inflamed and gave rise to symptoms, the remainder being discovered accidentally. By their shape and feeble musculature, retention of faecal material was encouraged, and the way to subsequent infection and diverticulitis laid open. The physician saw these cases for one or more groups of symptoms—disturbance in the normal routine of bowel movement, abdominal pain, local or regional colitis, or vague ill-health associated with fever, shivering, and leucocytosis. Treatment took the form of what was somewhat euphemistically called "colon hygiene," and was as necessary, as a protective measure, where diverticula have been discovered accidentally as it was in established diverticulitis. At first, and whenever acute symptoms were evident, a bland diet of cereals, milk, eggs, and fish was desirable, with a period of rest in bed. Later, a full, well-balanced diet might be planned, though some loss of weight should usually be aimed at. Roughage must be always avoided and soft vegetables should be passed through a sieve. The bowels needed scrupulously careful regulation to avoid extremes; soft, semi-formed stools should be aimed at, but any form of irritating aperient was absolutely contraindicated. Rectal irrigation, if carefully given through tube and funnel at a pressure of certainly not more than 18 in. and limited to one pint, was occasionally valuable, especially where there was acute pelvic inflammation. An occasional enema of warm olive oil up to 6 oz., given over-night and retained till the morning, might also be used as a routine once a week or at longer intervals. Belladonna and hyoscyamus were certainly valuable in relieving the spasm and pain associated with diverticulitis. The mode of life should be one of all-round moderation; exercise in the form of walking, golf, shooting, and riding was good. A system of general massage and graduated abdominal exercises such as were embodied in the term "abdominal culture" were useful. Abdominal massage, however, was an appalling blunder, and Dr. Hardy had seen it precipitate an attack of subacute obstruction. A well-fitting belt to maintain intra-abdominal pressure was desirable when there was much protrusion.

Dr. HAROLD BLACK said that of 432 patients examined by barium enema in 1934, 68 showed diverticula (36 men and 32 women). He thought that few of those with diverticula developed diverticulitis, and mentioned that 15 per cent. of cases with carcinoma of the colon showed diverticula. It must be remembered that radiological abnormalities were not necessarily the cause of the patient's symptoms; one patient had numerous diverticula but the symptoms were later shown to be due to a ureteral calculus. Dr. Black thought the inflammatory bowel wall changes might be a result of the diverticula rather

than their cause, and that a degenerative change in the musculature of the bowel was a precursor.

Dr. J. F. BRAILSFORD did not think that diverticulitis was a contributory factor in carcinoma coli. Any association of the two diseases was probably accidental.

The PRESIDENT asked whether the condition might not be a disease of civilisation. Was the colon undergoing atrophy? What were the possible causative dietetic factors? He did not believe that inflammation was the cause of diverticula, but held that irregular bowel contractions were possibly concerned. He had seen two cases of plumbism with diverticula present.

PATHOLOGICAL SOCIETY OF MANCHESTER

At a meeting of this society on Feb. 12th Prof. S. L. BAKER and Dr. J. CRIGHTON BRAMWELL read papers on the

Pathology of Heart Disease

Prof. BAKER pointed out that inflammatory lesions in the myocardium itself appear to play little part in the production of myocardial failure. Vascular lesions due to coronary obstruction, atheromatous or syphilitic, were the chief cause of gross myocardial lesions. The development of a collateral circulation by anastomoses between coronary branches and pericardial branches from extracardiac thoracic vessels could modify the effects of coronary occlusion, particularly if this occlusion was gradual. Cases of complete obliteration of both coronary orifices by syphilitic disease had been reported; here the heart was supplied for a time entirely by such collaterals. Most workers at the present time believed that angina pectoris was produced by anoxæmia of the myocardium; it was usually, though not always, associated with coronary narrowing.

Cases of cardiac failure with myocardial hypertrophy formed an important group; such failure often occurred apart from valvular lesions in persons

with hypertension. A proportion of such cases showed coronary athero-sclerosis, but there were many without coronary obstruction in which, apart from hypertrophy, the myocardium showed no appreciable pathological change. The cause of myocardial failure in such hearts was a matter for speculation. There seemed a probability that the vascular supply failed to keep pace with the greatly increased bulk of hard-worked muscular tissue. Karsner and his co-workers had shown that in cardiac hypertrophy there was no appreciable increase in the number of muscle-fibres but a great increase in the mean diameter of each fibre. Unless the number of capillaries per muscle-fibre was greatly increased such hypertrophied fibres would be inadequately supplied with blood. No one had as yet investigated the problem from this point of view.

Summing up the pathology of myocardial failure, it could be said that, excluding acute toxic effects, factors interfering with the blood-supply, and certain rare cases of lesions of the conducting system, there remained a large group of cases of myocardial failure without adequate pathological findings. Here one had to assume that there was functional damage from overwork and possibly a failure of the blood-supply to keep pace with the demands of the hypertrophied and heavily worked muscle-fibres.

Dr. CRIGHTON BRAMWELL, after reviewing the changes which had taken place in the outlook on cardiology during the past fifty years, suggested that patients complaining of cardiac symptoms might be classified in three groups: (1) those with heart disease, (2) those with neuro-circulatory asthenia, and (3) those in whom symptoms were attributable to an anxiety neurosis. The first group consisted of inflammatory, degenerative, and other lesions of the heart itself, while in the second group the cardiac manifestations were secondary to such conditions as focal sepsis or disease in other parts of the body. Heart disease, neuro-circulatory asthenia, and anxiety neurosis might all be present in the same patient; in fact it was rare to meet with a case of heart disease in which there was not some element of neurosis.

REVIEWS AND NOTICES OF BOOKS

Localized Rarefying Conditions of Bone

By E. S. J. KING, M.D., D.Sc., M.S. Melb., F.R.C.S. Eng., F.R.A.C.S., Honorary Surgeon to Out-patients, Melbourne Hospital; Stewart Lecturer in Pathology, University of Melbourne. London: Edward Arnold and Co. 1935. Pp. 400. 35s.

ONE of the most fascinating features of medicine is the appearance, waxing, and waning of certain morbid conditions as centres of interest and attention. The interest aroused by particular diseases or injuries varies enormously from one decade to another quite independently of their prevalence. At the moment anything labelled "osteochondritis" evokes a prompt response from orthopædic surgeons, and the issue of a complete guide book to this maze of conditions is therefore timely. The initial and greatest difficulty is one of nomenclature: the G.O.M. of the osteochondritides (though not the first to be described) has been christened no fewer than fifteen times, and it is to be hoped that the name selected by Mr. King, "osteochondritis of the upper epiphysis of the femur," will now be accepted as the official title, if only for the sake of simplicity.

In this work the author has brought together all that is known about the various forms of osteo-

chondritis and certain types of bone atrophy. His command of the vast literature on the subject is so complete that the reader must be on guard lest he should overlook the author's own useful contributions. There is hardly an epiphysis in the body that has not been the site of an osteochondritis, and Mr. King has been vigilant in collecting references to all the forms of it, however rare. Legg-Perthes' disease and Osgood-Schlatter's disease are not typically "rarefying conditions of bone" and have little relation, as the author shows (p. 291), with Kummell's disease and its allies which are. All the same, a most useful service has been rendered in bringing together both groups of these puzzling conditions, and this book will almost certainly be a standard work of reference for many years to come. The first section deals with bone as a tissue, radiographic appearances, and certain anatomical features; the second describes every known form of osteochondritis. It is exasperating that, despite the efforts of Mr. King to lay before us all that is known, we are still very much in the dark about the aetiology and pathology of this type of bone disease. Good functional recovery so frequently follows conservative treatment that conscientious surgeons have had little opportunity of obtaining pathological material, and experimental

work has, for the most part, given little help. Various forms of bone atrophy, in which trauma plays a definite part, are described in Section III., and here again the exact causation is a matter for speculation. An excellent account of osteochondritis dissecans completes this work for which (apart from an X ray reproduced upside down on p. 287) we having nothing but praise.

The title of the book is not of the author's choosing; it was the subject set for the Jacksonian Prize of the R.C.S. for 1933, which distinction Mr. King won.

Bacteriology of Typhoid,

Salmonella, and Dysentery Infections and Carrier States. By LEON C. HAVENS, M.D., Director of Laboratories, Alabama Department of Public Health. New York: The Commonwealth Fund; London: Humphrey Milford, Oxford University Press. 1935. Pp. 158. 7s. 6d.

Now that the enteric fevers have become an intermittent rather than a continuous problem in this country a book by an enthusiastic worker with long experience of an endemic zone is particularly valuable. The late Dr. L. C. Havens was director of laboratories to the Alabama Department of Health, and in this little book he has given us the fruits of his experience in a clear and attractive form. The manual is essentially practical, but certain theoretical matters such as the different antigens of the typhoid-salmonella group are simply and adequately discussed. Stress is laid on the fallacious nature of a purely serological diagnosis of the enteric infections. The author points out that it should be possible to isolate the causative organism in a large percentage of cases, and he devotes a good deal of attention to the methods by which this can be done. The description of salmonella infections is apposite, and the subject has been shorn of the complexities with which it is usually presented in English bacteriological literature. A list of references giving in full the titles of papers is supplied at the end of each chapter and adds to the usefulness of an excellent little monograph.

An Index of Treatment

Eleventh edition. By Various Authors. Edited by ROBERT HUTCHISON, M.D., LL.D., F.R.C.P., Consulting Physician, London Hospital. Bristol: John Wright and Sons, Ltd.; London: Simpkin Marshall Ltd. 1936. Pp. 1020. 42s.

THE eleventh edition of this classic work, which begins with the editor's admirably succinct remarks on the principles of therapeutics, includes many subjects not dealt with in previous editions. For example, articles are supplied by the editor on agranulocytosis and its treatment by pentnucleotide, by Prof. A. W. M. Ellis on alkalosis, and by Dr. G. W. Bray on the complex problem of allergic disease. Dr. Donald Hunter writes on idiopathic steatorrhœa and tetany in the adult and the various techniques of cisternal puncture and its therapeutic possibilities are described by Dr. W. M. Feldman. Two other important new articles are by Dr. C. Newman on the functional disorders of the gall-bladder and by Dr. R. Lightwood on the anæmias of childhood. Many other sections have been revised or rewritten in the light of recent knowledge, but it is gratifying to see that those of Mr. James Sherren, a former editor, have been substantially retained. The surgical,

X ray, and glandular therapy of acromegaly are discussed by Dr. H. Gardiner-Hill. Prof. L. J. Witts deals with the treatment of the anæmias and Dr. S. Levy Simpson with that of Addison's disease by cortin injections. The section on the ear has been rewritten by Mr. L. Graham Brown, and Mr. Eardley Holland writes on calcium gluconate in the modern treatment of eclampsia. The treatment of acute nephritis by orange juice, of hypertensive encephalopathy by venesection and lumbar puncture, and of the various types of renal œdema are clearly expounded in Prof. Ellis's contribution on nephritis. There are nine articles by Mr. Victor Dix on various genito-urinary conditions and Dr. Levy Simpson describes the treatment of Raynaud's disease by calcium, parathyroid, thyroid, œstrin, and, if necessary, ganglionectomy. The potentialities of superficial and deep X ray therapy are summarised by Dr. J. F. Carter-Braine and the indications for treatment by Sanoecrysin, artificial pneumothorax, phrenic paralysis, and thoracoplasty are described in Dr. L. S. T. Burrell's masterly article on pulmonary tuberculosis.

It is no exaggeration to say that this book is a necessity to all who are seriously concerned with therapeutics, and the practitioner, temporarily depressed by lack of therapeutic success, will find herein much to cheer and inspire him to further effort.

Thorpe's Dictionary of Applied Chemistry

Supplement to Vol. III. By JOCELYN FIELD THORPE, C.B.E., D.Sc., F.R.S., F.I.C., Professor of Organic Chemistry and Director of Organic Laboratories, Imperial College of Science and Technology; and M. A. WHITELEY, O.B.E., D.Sc., F.I.C., formerly Assistant Professor of Organic Chemistry at the College. London: Longmans Green and Co., Ltd. 1936. Pp. 166. 21s.

IN the course of their preparation of the first two volumes of the supplement to Sir Edward Thorpe's classic work, the editors realised that within the past decade so many new technical terms have been coined that even the expert may find it difficult to understand expressions used outside his own branch of chemistry. To meet this difficulty they have now issued, together with the index to the supplement, a glossary of the terms used in it and of some other words and phrases which are in vogue in laboratory and factory. In completing the supplement they have thus provided us also with a compact independent work of reference whose value is enhanced by its pleasing and legible type.

Chronic Streptococcal Toxæmia and Rheumatism

By J. D. HINDLEY-SMITH, M.A. Camb., M.R.C.S., L.R.C.P. London: H. K. Lewis and Co., Ltd. 1935. Pp. 275. 7s. 6d.

THE streptococcus is cast for the part of villain in this book and is held responsible by the author for an unpleasant condition which is called chronic streptococcal toxæmia. This condition which, he believes, may begin in childhood, is gradual in its progress and in its method of establishing itself, but may ultimately condemn those who suffer from it to a life of semi-invalidism. Chapter I. opens well. Most readers will be in sympathy with the author's claim that the clearly defined and labelled diseases which progress according to a definite programme, and are described in text-books, account for a minority of

the ills of mankind; whereas most of the diseases met with in general practice are neither well defined nor really understood, and much good could be done by collecting and sorting out clinical observations, particularly those made by experienced practitioners. When, however, Dr. Hindley-Smith proceeds to such statements as "the vast majority of cases suffering from chronic toxæmia are suffering from acid toxæmia, and the causes giving rise to acid toxæmia are legion," most of us will part company with him. This conception of acidity and acid toxæmia in relation to the rheumatic diseases has surely been discarded. In their book on chronic arthritis reviewed in *THE LANCET* (1935, i., 618) Pemberton and Osgood say wisely: "One frequently hears from patients the statement that his doctor has told him he was 'too acid,' to counteract which condition he was given alkali in some form. The time is past when medical men can afford to tolerate such vagaries which have neither clinical nor scientific justification." Dr. Hindley-Smith's suggestion that the victim of prolonged anaesthesia will experience the feeling of general poisoning throughout the system long after consciousness has returned is also misleading. The alarming picture drawn of the sufferer from chronic streptococcal toxæmia is surely exaggerated. So the book goes on, a mixture of shrewd observation and comment interlarded with loose statements for which there is no scientific support. All we can say of it in praise is that the section on treatment should help the doctor whose patients are clamouring for "something to be done."

The Anti-Drug Campaign

An Experiment in International Control. By S. H. BAILEY, Senior Lecturer in International Relations, London School of Economics and Political Science. London: P. S. King and Son, Ltd. 1936. Pp. 264. 12s.

Mr. Bailey has put together a useful and timely account of the tangled story of the efforts to secure international control of the traffic in dangerous drugs, from the Shanghai Commission of 1909 to the Convention on Limitation of Manufacture of 1931. In an appendix extending over a hundred pages there are set out the provisions of the Hague Convention of 1912, the Geneva Agreement and Convention of 1925, the Bangkok Agreement and the Limitation Convention of 1931. The evolution of international control of the traffic in opium, morphine, heroin, and cocaine is described, but it is recognised that side by side with the licit demand, clandestine opium smokers and drug addicts create an illicit demand of unknown volume. There is thus encouraged the harvesting of quantities of the raw materials which bear no relation even to the most liberal estimates of legitimate requirements. The author regards the Hague Opium Convention of 1912 as an event of the highest significance, being the initiation of a multilateral international instrument for combating a world-wide evil. In view of the persistence of legalised opium-smoking in the Far East, he naively remarks that it is difficult to resist the conclusion that European Powers have taken a lighter view of their responsibilities to the peoples subject to their administration in Eastern Asia than to their nationals in their home countries. The improvements effected under the Geneva Convention of 1925 in the control of international traffic in drugs and the creation of the Permanent Central

Opium Board are set off against the failure to limit the production of raw opium and coca leaves to legitimate requirements, a step contemplated by the League of Nations and demanded by the United States delegation. That more remained to be done was shown by the Secretariat of the League when it reported that between 1925-29 more than 100 tons of habit-forming drugs derived from morphine passed into illicit traffic. The disclosures in the "Naarden case," where a licensed Dutch factory was found to have exported over 2000 kg. of heroin and 860 kg. of morphine to the Far East in a little more than one year shocked a good many complacent people, as did also the revelation by Russell Pasha of the havoc wrought in Egypt by uncontrolled drug factories in Istanbul. There followed in 1931 the conference and convention on the limitation of manufacture and distribution of narcotic drugs which did not, however, extend to the production of raw opium, coca leaves, prepared opium, or Indian hemp. The attempt to establish a quota system for allocating to each nation a proportion of the world requirements of the drugs in question having been abandoned, the supervisory body, set up by the 1931 Convention, has achieved considerable success in securing both national and international control of the traffic in narcotic drugs. Much remains to be done, notably in the restriction of production of raw opium and coca leaves, but the author is justified in ending his lucid account of the anti-drug campaign with the conclusion that from the tangle of mixed motives which divide the erratic course of governmental policy a constructive purpose has emerged and seems destined to prevail.

A Short Ante- and Post-Natal Handbook

By R. KELSON FORD, M.D., M.M.S.A., St. Olave's Hospital, Rotherhithe. London: Humphrey Milford, Oxford University Press. 1935. Pp. 141. 6s.

OUR medical schools and hospitals have something to learn, especially on antenatal supervision, from the clinics and hospitals under local health authorities. The public antenatal clinics are primarily a system of constructive hygiene, whereas those of the teaching and voluntary hospitals or departments remain too exclusively a means of picking out doubtful or abnormal cases for special observation and management. Hence we look for greater prominence of the hygienic, social, and educational aspects in a manual by one in the service of a local authority than in similar books from the teaching schools. Dr. Kelson Ford's introductory chapter is excellent in that these aspects are placed in the foreground of the picture. The reason for antenatal supervision is much more than the detection of pelvic deformity and albuminuria. Stress is laid on the necessity for the careful study of the individual patient, her instruction in hygiene for herself and the infant after birth; the advice to the doctor to make an effort to assess the attitude of mind in which pregnancy is regarded is much needed. Although Dr. Ford has laid down the principles clearly and concisely, he has not been successful in weaving them into the texture of practice with the same clarity and emphasis. The "Author's Note," which occupies the place and office of a preface, does not say more of the object he had in mind than that "no attempt has been made at being exhaustive, a helpful suggestiveness being the aim." This aim has undoubtedly been fulfilled, for he has produced a useful and stimulating

guide to ante- and post-natal care that will appeal to a large class of family practitioners, from whom much is now expected in the way of such service.

Our chief regret is that Dr. Ford has thought fit "to collect information not always readily accessible" into a small handbook, which is not the place for out of the way information. The outstanding instance is an encyclopædic classification of monstrosities and malformations, happily relegated to the appendix, where it takes up more space than any of the other and more suitable matters considered therein. Although he apologises for including much that is elementary, these portions modified in the light of personal experience form the most valuable characteristic of his book, and would best bear expansion. Further detail in such matters as physical exercises for pregnant and lying-in women or in the technique of assessing the patient's mental reaction to pregnancy would have been a welcome addition and most helpful. We trust, also, that other authors in the service of public authorities will not feel constrained to include such a disclaimer as "the London County Council is in no way responsible for any opinion or matter presented." It is a terrifying suggestion that city fathers and county councillors might assume some form of censorship over medical thought and practice, even if only among those in their own service.

Urology in Women

Second edition. By E. CATHERINE LEWIS, M.S. Lond., F.R.C.S. Eng., Surgeon to the Royal Free Hospital; Surgeon and Urologist to the South London Hospital for Women. London: Baillière, Tindall and Cox. 1936. Pp. 100. 6s.

MINOR urinary troubles in women are particularly liable to be missed or to receive inadequate treatment. This is specially true of lesions of the urethra and bladder, organs that lie on the boundary of gynæcological practice and in which the gynæcologist as a rule is not keenly interested. Minor lesions of the urethra are often missed, and the examination of this structure even by the urologist himself is often perfunctory. It was therefore the sections in the previous edition of this book which dealt with such conditions as urethral prolapse, urethritis, stricture, displacements of the bladder, and vesical neck obstruction that proved especially valuable. In this edition sections on nephroptosis and on changes in the ureters during menstruation and pregnancy have been added.

The book should be studied not only by practitioners, but also by gynæcologists and urologists.

Glandular Physiology and Therapy

A Symposium prepared under the auspices of the Council on Pharmacy and Chemistry of the American Medical Association. Chicago: American Medical Association. 1935. Pp. 528. \$2.50.

DURING 1935 a series of excellent articles on glandular physiology and therapy appeared in the *Journal of the American Medical Association*, prepared under the auspices of the council on pharmacy and chemistry of that Association. These articles have now been collected together to form a symposium of a comprehensive nature. The last publication of the kind appeared originally in 1925 and in revised form appeared two years later. Since then, however, remarkable advances have taken place in endocrinology. Each chapter is an authoritative discussion

by a well-recognised worker. Thus, Evans writes upon the clinical manifestations of dysfunctions of the anterior pituitary and the growth hormone; Collip deals with the inter-relationship among urinary, pituitary, and placental gonadotropic factors; Allen discusses menstruation and the physiology of oestrogenic principles; and Marine writes on goitre; other chapters are supplied by Best, Joslin, Aub, Aschheim, Fishbein, Novak, and Zondek.

Clinicians and physiologists alike will appreciate this symposium.

THE RED CROSS AS SANCTUARY

A MEMORANDUM on observance of the Red Cross in warfare has been prepared for presentation to the Italian Ambassador by members of the medical profession. Its terms are as follows:—

We, who sign this memorandum as members of the medical profession, wish in this way to express our profound uneasiness at the news of certain incidents that have occurred in the course of the present war between Italy and Abyssinia. It is reported that on six occasions units clearly displaying the Red Cross have been bombed from the air by the Italian forces; and it seems to be established that on some of these occasions, at least, the action was premeditated.

The members of our profession have never assumed or claimed that they, any more than other citizens, should be held immune from the risks of war. The character of their work calls for men and women of normal courage; and the casualties among doctors attached to fighting units during the European War are themselves proof that this protest is no mere personal one. Our sense of indignation lies far deeper. In wartime, the wounded and those who attend them have for long past been considered as in a sanctuary when beneath the Red Cross. Amongst civilised peoples the Red Cross has been looked upon as an assurance that, above the shifting tides of national strife, commercial rivalry and war, there still lives the true bond of common humanity. If this permanent bond, symbolised by the respect customarily paid to the Red Cross, is also to be destroyed, then mankind takes a further step backwards towards the chaos of barbarism.

The fact that our profession usually does its work unostentatiously makes it all the more becoming that we should from time to time express ourselves most emphatically on a matter that so gravely touches our professional conscience. It is necessary that all who follow the vocation of medicine should insist that the symbol of the Red Cross in war be held absolutely sacrosanct.

In order that the protest may be as effective as possible, all those who wish to associate themselves with it are requested to communicate as soon as possible with Dr. T. O. Garland, 23, South Hill Park-gardens, London, N.W.3, so that their names may be added to the list of supporters.

The preliminary list of supporters, we are informed, includes:—

Rt. Hon. Christopher Addison, P.C.
 Dr. G. F. Barham.
 Dr. F. G. Bushnell.
 Dr. D. Elizabeth Bunbury.
 Dr. William Barr.
 Dr. E. Vipont Brown.
 Dr. H. Crichton Miller.
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THE LANCET

LONDON: SATURDAY, MARCH 7, 1936

MESCALINE IN PSYCHIATRIC RESEARCH

THE field for controlled experimental research in psychiatry is still so small that it demands intensive cultivation. One of the few methods available is a pharmacological one—i.e., the use of intoxicating drugs. The psychosis thus produced can be studied with a much closer regard to experimental requirements than is possible with the mental disorders in general, dependent as they are on a variety of causes which the investigator can seldom influence in any predictable direction. Foremost, though not unique, among the intoxicants that may be used for research along such lines is mescaline. Now available as a synthetic drug, its ritual use on the American continent stretches back to the time before the Spanish Conquest. Fascinating as are the ethnological associations of the mescal plant, it is as a source of beatific visions that it has become generally and somewhat romantically known in Western Europe. The visions consist of fantastic forms and colours constantly changing but always bright. Dr. MACDONALD CRITCHLEY, who made some subjective experiments in 1930, described¹—

“a meadow with buttercups and daisies; now it is changing into a stereotyped park, with a bandstand and with chairs, each one of which is whizzing rapidly round on its own axis. Butterflies are coming in from all sides; the bandstand has disappeared. The butterflies all collect into the centre and arrange themselves into a circular, brightly coloured flower-bed, rotating rapidly in a clockwise direction, in a most wonderful manner . . . now a huge field of primroses . . . a complicated pattern like Hampton Court maze, brightly coloured with objects moving quickly in a snake-like, sinuous fashion along the apparently endless pathways of the maze.”

All who have enjoyed the contemplation of just such sights and sequences in a Silly Symphony will appreciate what a state of rapture they may induce. The range of the abnormal phenomena to which mescaline gives rise is, however, wider and more important from the investigator's point of view than the visual disturbances alone. The independent phenomena in other sensory territories, the synæsthesiæ, the alteration in bodily feeling, the disorder experienced in space and time-judgments, the effects on mood and thought, the depersonalisation and the power of detached observation of oneself are among varied manifestations which have been closely studied by psychiatrists. WEIR MITCHELL and HAVELOCK ELLIS drew attention to them in the last century; since the war some workers at Heidelberg, ROUHIER in France and others have examined the matter thoroughly.

At the meeting of the Royal Medico-Psychological Association on Feb. 26th Dr. ERICH GUTTMANN described investigations to which he had contributed before he came to England, and gave an account of the further mescaline research which he and others are carrying out at the Maudsley Hospital. By means of the Rohrschach test, administered to the same persons before and after intoxication, he had observed the changes in those responses which are regarded as indicative of the psychological type and personality of the subject. By this means the contribution of the individual to the psychosis—a question of the first importance for psychopathology—can be studied, as well as the effect of specific noxæ on psychic structure; the rôle of perception in the total personality also enters into the field of experiment. On the same subjects (normal volunteers) Dr. W. H. HUBERT and Dr. AUBREY LEWIS studied by a special optical technique the changes in Gestalt-formation produced by the drug; striking variations were found, again bearing on the importance of the perceptual side of personality. Comparative investigations, using the same technique, but without mescaline, on schizophrenic patients and others with depersonalisation were made, and provide an instance of the valuable approach which mescaline affords to the study of mental illness, especially where, as in schizophrenia, the investigator cannot otherwise than by mescaline himself gain any subjective experience of the incommunicable phenomena. Dr. GUTTMANN has, moreover, in conjunction with Dr. W. S. MACLAY, attempted to make therapeutic use of the drug. The known effects on sensory function led them to expect that the symptom of depersonalisation with feeling of unreality might be so modified or abolished temporarily by small doses of mescaline that the patient would be more accessible, after this relief, to psychotherapy. The results, so far as feelings of external reality were concerned, conformed to expectation (though not in all cases) and the change extended beyond the period of intoxication. Incidentally Dr. GUTTMANN and Dr. MACLAY hold that to give mescaline continuously to any patient would not be justifiable while we know so little about the dangers of chronic mescaline intoxication.

The information available about the oxidative and enzymic activities of the brain during mescaline intoxication has so far indicated only a common mode of action of narcotics and throws no light on the specific effects of the drug. Dr. P. K. McCOWAN stressed the importance of further research into these activities. Dr. GUTTMANN referred to the physical changes which appear during intoxication and to their metabolic significance. It is noteworthy that in 1932 an observer reported that in hashish intoxication the output of salt and water is increased, without any concomitant hydræmia; it is not known whether any corresponding change is associated with mescaline. It is an attractive speculation that there may be links between mescaline and some of the end-products of protein metabolism—e.g., tyrosine—

¹ See THE LANCET, 1930, II., 863.

to which it is chemically allied; an attempt to discover whether some perversions of normal metabolism result in the production of a toxic substance closely akin to mescaline pharmacologically as well as chemically might be fruitful. Admittedly no substance closely related chemically to mescaline has as yet been found capable of giving rise to its remarkable effects; whether further research be metabolic or psychological, the value of a pharmacological approach to the problems of psychiatry can hardly be doubted.

HEAT REGULATION AND FEVER

IN his Arris and Gale lectures just delivered before the Royal College of Surgeons of England Dr. JOHN BEATTIE reviewed various aspects of the heat-regulating mechanism of the body, and expressed his belief that this mechanism is much more complicated than has hitherto been realised. The notion that heat regulation is dominated completely by a single centre is in his opinion misleading, and he was able to show that sections at different levels of the central nervous system produce widely different effects. The argument in favour of a single centre has been founded largely on experimental demonstration that section of the cervical cord completely abolishes the heat-regulating mechanism so that the animals become poikilothermic. To support this conception there is also the older evidence from heat piqure, and the more recent observations that local heating of the hypothalamus is followed by lowering of the body temperature, and local cooling by a rise in the body temperature. To the contrary, however, we have abundant clinical evidence, beginning with a case recorded by BRODIE in 1837, that in man complete destruction of the cervical cord is not always followed by a loss of heat regulation and that even fever has been observed in such patients. A few isolated observations on animals are also on record such as those of GOLTZ and EWALD in 1896, and the more recent ones of POPOFF,¹ where heat regulation was maintained after removal of the spinal cord from the cervical region downward with subsequent cutting of the vagus and sympathetic in the neck. In order to determine the reason for this contradiction, THAUER,² working in BETHE's laboratory, has lately carried out an extensive experimental reinvestigation of the effects of section of the cervical cord on a large number of rabbits, guinea-pigs, and rats. Suspecting that the discrepancies might be due to immediate shock effects masking the true results of the operation, he endeavoured to improve the operative technique and post-operative treatment. By keeping the animals immediately after the operation in a thermostat at 28°-30° C. and by careful attention to their feeding, he succeeded in keeping a number of animals alive for several weeks, and three rabbits for two months after the operation. In all these animals the heat-regulating mechanism was almost completely restored, although during the first few

days after the operation it was severely impaired. When once the heat regulation had been restored subsequent cutting of the cervical sympathetic and of the vagi, and even subsequent partial removal of the thoracic spinal cord, failed to impair it. THAUER's results agree, therefore, with those of POPOFF in showing that in warm-blooded animals after complete exclusion of the central nervous system the heat regulation of the body can be efficiently maintained by a peripheral mechanism. The nature of this peripheral mechanism has been indicated by the work of CRAMER, who showed in his well-known monograph³ that in addition to the nervous mechanism for heat regulation there is a humoral mechanism with which the thyroid and adrenal glands are particularly concerned. Since most of the factors concerned in heat regulation are controlled by the sympathetic nervous system, they can be brought into play either by nervous or by humoral stimulation. Thus fever can be produced experimentally by functional hyperactivity of the thyroid or adrenal glands, and THAUER has shown that his animals deprived of their central nervous control still respond to infections or to the injection of pyrogenic substances by fever.

The experiments of POPOFF and of THAUER must, of course, not be interpreted as denying the existence of a nervous mechanism for heat regulation or of a central coördination of such a mechanism. Such a conclusion would be as crude and as misleading as the reverse one that the thyroid or adrenal glands have no part in the processes of heat regulation because these processes can still be efficiently maintained after removal of one or other of these organs. We are being led to a belief that there are two mechanisms for heat regulation, one central and the other peripheral, a conception in keeping with modern physiological trends in other bodily functions. In the control of water metabolism, the control of equilibrium, and in sensory discrimination there are parallels for the overlaying of a crude peripheral type of regulation by a more delicate centralised one. On our present knowledge of heat regulation it must be supposed that the intracranial apparatus is not essential to an adequate working, but rather by allowing an interplay between the different peripheral factors serves to increase their efficiency, especially under pathological conditions.

The conception of a single centre dominating heat regulation has tended to sterilise progress, and a study of LAKIN's Lettsomian lectures⁴ reveals how scarce investigations on the phenomenon of fever—one of the most frequent and important clinical symptoms—are in the recent physiological, pathological, and clinical literature. It is easy to understand why this should be so. On the unitary conception fever is explained as being due to some action on the heat-regulating centre in the brain which is likened to a thermostat, and in fever is

¹ Popoff, N. F.: *Arch. f. d. ges. Physiol.*, 1934, cexxiv., 137.

² Thauer, R.: *Ibid.*, 1935, cexxxvi., 102.

³ Cramer, W.: *Fever, Heat Regulation, Climate, and the Thyroid-Adrenal Apparatus*, London, 1928.

⁴ Lakin, C. E.: *Disturbances of the Body Temperature*, THE LANCET, 1934, ii., 467.

supposed to be "set" at a higher temperature. But from what has been said above, and from what Dr. BEATTIE said in his lectures, it is clear that if there is a heat-sensitive zone in the brain there must also be other thermo-regulators outside it—represented perhaps by the sympathetic ganglia. Formerly it was assumed that the fever of infectious diseases is due to the action of bacterial toxins on cerebral centres; but it has now been shown that many bacterial toxins circulating in the blood cannot pass the blood-brain barrier,⁵ which is additional evidence that their effects must be on the periphery. Moreover, it is now known that some pathological conditions of the thyroid or adrenal glands are associated with a pyrexia indistinguishable from that of an acute infection, for which in the past they have been frequently mistaken. This recent work on the decentralisation of sympathetic functions may well open up new fields for clinical applications in the pathogenesis and treatment of infectious diseases and of other pyrexial conditions whose origin is at present only surmised.

ACUTE NICOTINE POISONING

LAST week Dr. L. P. LOCKHART drew attention in our columns to a case in which a father, in order to make his 14-year-old boy give up smoking, adopted the heroic measure of forcing him to eat a cigarette. Curiously enough, "the father's action appears to have received the approval of the court," and Dr. LOCKHART rightly raised a protest. It is salutary to remember that poisoning by small doses of concentrated nicotine is usually rapidly fatal, and that present-day remedies are often of no avail. Admittedly recorded fatal cases are few, but as ESSER and KÜHN⁶ point out their incidence has increased recently. In many of them nicotine is taken with suicidal intent, but poisoning has also occurred in factories where concentrated nicotine is handled and in tobacco factories. Non-fatal poisoning is seen among cigar and cigarette makers who inhale tobacco dust and among workers who handle concentrated nicotine and may have their skin splashed with it. The main symptoms are ocular troubles, such as partial blindness with limitation of the fields of colour vision, functional heart disease, and nervous disorders. ALICE HAMILTON⁷ says that new workers in factories often suffer from the same disorders as the inexperienced smoker—headache, palpitation of the heart, rapid irregular pulse, nausea, and vomiting. She regards the evidence for the existence of chronic nicotine poisoning as scanty because sooner or later an immunity to the drug is established. However this may be, it is certain that more cases of acute nicotine poisoning are occurring at the present time, and it is therefore important that an adequate method of treating it should be found.

FRANKE and THOMAS,⁸ who have just reviewed the subject, say that apart from the usual procedures for removing any unabsorbed poison and the administration of stimulants, they have been unable to find any description of a rational treatment for nicotine poisoning. The condition is usually considered to be hopeless: "this pessimistic attitude is apparently due to the belief that the drug causes generalized paralysis of the central nervous system, based on the fact that complete muscular paralysis, loss of reflexes and paralysis of respiration (and finally of circulation) follow its absorption in sufficiently large doses." Their own experiments on dogs, however, lead them to think that death from nicotine poisoning is caused by peripheral, rather than central, paralysis of the respiratory muscles. Further, they show that nicotine does no evident irreparable damage to any of the structures on which it acts, and that the administration of very large doses is not incompatible with reasonably prompt and apparently complete recovery when appropriate treatment is started in time. FRANKE and THOMAS come to the important conclusion that nicotine poisoning should be regarded as a temporary respiratory emergency comparable with drowning or electric shock, and should be treated in the same way as these two conditions, especially by artificial respiration. They tried various means of treatment and resuscitation on 52 dogs poisoned with nicotine and found that if artificial respiration was applied before the circulation had failed, and maintained until the muscular paralysis had disappeared, each animal made a complete recovery. When treatment was started after failure of the circulation, artificial respiration by itself was usually not sufficient; but that if the animals were given in addition intracardiac injections of epinephrine (adrenaline) and indirect cardiac massage about half of them recovered. The important thing about these experiments is that they demonstrate that the circulatory failure which follows fatal doses of nicotine in dogs is not necessarily permanent, but that if the heart can be restarted and artificial respiration maintained prompt recovery is usual.

If FRANKE and THOMAS's conclusions are valid and can be applied to man they should lead to an increase in the proportion of recoveries from acute nicotine poisoning; for these authors have been able to find only 3 recorded in which artificial respiration has been used in its treatment. MOORE and ROWE⁹ in 1897 pointed out that the observed effects of nicotine could all be as readily ascribed to a curare-like action of the drug as to a central paralysis; and GOLD and BROWN¹⁰ have recently presented strong evidence that in animals it causes a peripheral rather than a central paralysis of respiration. It appears therefore that artificial respiration is the basis of a rational treatment for acute nicotine poisoning.

⁵ Friedemann, V., and Elkeles, A.: THE LANCET, 1934, i., 719.

⁶ Esser, A., and Kühn, A.: Deut. Zeits. f. d. ges. gerichtl. Med., 1933, xxi., 305.

⁷ Hamilton, Alice: Industrial Toxicology, New York, 1934, p. 246.

⁸ Franke, F. E., and Thomas, J. E.: Jour. Amer. Med. Assoc., Feb. 15th, 1936, p. 507.

⁹ Moore and Rowe: Jour. of Physiol., 1897, xxii., 273.

¹⁰ Gold, H., and Brown, F.: Jour. Pharmacol. and Exper. Therap., 1935, liv., 143.

PENAL CASES IN CAMERA BEFORE THE G.M.C.

THE prolonged hearings in camera recently of penal cases coming under the consideration of the General Medical Council may have been taken as evidence of a tendency on the part of the Council to conduct more of such proceedings without a public audience. But as a matter of fact the situation is not so, and the circumstances at the last session of the Council were quite fortuitous. It is inadvisable, however, that an impression should remain that the G.M.C. is embarking upon a new policy of secrecy.

The penal jurisdiction of the Council rests substantially on these three words in the Medical Acts—"after due inquiry." The Acts provide that, in cases other than those based on convictions of felony or misdemeanour, the Council, if it finds "after due inquiry" that the practitioner has been guilty of infamous conduct in a professional respect, may direct the Registrar to erase the practitioner's name from the Register. We need not now refer to the unfortunate phraseology which has led to frequent protest. The word infamous has a technical legal meaning explained by the judges as disgraceful or dishonourable in a qualified professional man acting as such; but the scope of the words "after due inquiry" has never been exactly defined. When an action of the Council has been the subject of legal inquiry the Law Courts have taken the view that the Council can be trusted to manage its own business properly and competently, and they will not interfere unless the complainant can show a substantial impropriety of procedure. The Council's procedure is governed by its standing orders, which probably lack the statutory force comparable with the by-laws of some other semi-public bodies. But the orders give the Council wide powers of discretion in deciding which, if any, parts of the case shall be heard in camera. The Council is obliged only to open the case, that is to have the charge read, and to give the judgment in public, and variation from procedure in courts of law is conspicuous. All courts are open to the public unless in the opinion of the judge it would be clearly impossible to do justice at a public hearing, and the judge's discretion here is limited. The class of cases in which courts have restricted publicity are those in which the subject matter of the action has been some secret process; those where a witness must give evidence of such a distressing kind that he would not bring his complaint at all if he knew that the hearing would be public; and thirdly, where disorder is held reasonably certain to break out in court during the hearing. The General Medical Council is only concerned with cases of the second class, and has interpreted its discretion widely. The criterion applied by the Council it would seem is not whether justice can be done at all in public but whether it can be better done in private, while taking note of the fact that in the interests of decency some cases had better be heard in camera. Anyone who has followed the penal procedure of the Council at all closely will know

how few are the cases that fall under the latter heading; and it must be remembered that medical men summoned to appear before the Council may be willing, and naturally would be when innocent, to have the procedure a perfectly public one, the decision to hold the inquiry in camera being that of the Council.

When public attention is arrested by penal cases before the G.M.C., there is a natural surprise that the verdict of the Council, though it may deprive a professional man of his livelihood, is subject to no appeal. The victim's friends, thinking him innocent, attack the doctor's profession for an act of injustice which is final. This absence of appeal is due not to the caprice of the profession but to the will of Parliament as declared in the Medical Acts. From disciplinary decisions in other professions—dentists and solicitors, veterinary surgeons and architects—there is in each case an appeal to the High Court under the corresponding statute. The Medical Acts alone make no such provision. Consequently, as Lord Justice BOWEN observed, when "due inquiry" has been made by the G.M.C., "the jurisdiction of the domestic tribunal, which has been clothed by the Legislature with the duty of discipline in respect of a great profession, must be left untouched by courts of law." But the courts of law will intervene fast enough if the tribunal displays bias or transgresses the rules of what is rather vaguely called "natural justice" in its inquiry. In that event, it is safe to predict, amendment of the Medical Acts will follow.

ON Tuesday, March 24th, at 5 P.M., Sir Thomas Barlow will take the chair at the hundredth annual general meeting of the Royal Medical Benevolent Fund, which is being held at 11, Chandos-street, London, W.1.

THE appointment of Mr. Wilfred Trotter, F.R.S., to a chair of surgery in the University of London, tenable at University College Hospital medical school, is recorded in another page. No academic honour could enhance the reputation of one who has long been recognised not only as a master of his craft but as a scholar whose ripe philosophy pervades all his activities. But by consenting to sacrifice the leisure gained through retirement from private practice he confers additional distinction on the institution which he has already served for many years.

MR. GEORGE VERITY, who died at his home at Chesham Bois on Feb. 28th, was a truly practical friend to the cause of medicine. He was for close upon thirty years chairman of the governors of Charing Cross Hospital, and everyone concerned with the welfare and organisation of the great London hospitals knew of the work which he did at Charing Cross and admired the foresight and energy displayed. He accepted the responsibilities of chairmanship at a critical period in the history of the hospital which was suffering perhaps more acutely than any other of the metropolitan institutions from financial depression. The fine position in public and scientific esteem in which the hospital is now held was greatly due to Verity, for whom, in his labours, no ideal was too large to aim at and no detail was too small for attention. He has left a great name in the hospital world.

ANNOTATIONS

WEIGHT-LOSS AND POST-OPERATIVE MORTALITY IN GASTRIC SURGERY

POST-OPERATIVE pulmonary complications are notoriously more common after upper abdominal operations than after most other major surgical procedures, and the factors that determine them are still imperfectly understood. Among those factors is undoubtedly the patient's "resistance," both to infection in general and to operative shock—an imponderable factor, one would have said, a measure of which would be of great value were it feasible. H. O. Studley,¹ of Cleveland, has just suggested that it may be in some degree ponderable after all, and that literally. He took a series of 46 consecutive patients operated on for gastric and duodenal ulcer, excluding urgent laparotomies for perforation and acute hæmorrhage. There were 7 post-operative deaths (15 per cent.). These seemed to bear no relation to age, pre-existing cardiac or pulmonary disease, the position of the ulcer, the presence of pyloric stenosis, or the nature and technique of the operation. When he calculated, however, the amount of weight that the patients had lost before they came to operation, he found that 6 of the 7 deaths occurred among those who were 20 per cent. or more below their normal or highest known weight. This group contained 18 patients, with weight-losses ranging from 21 per cent. to 43 per cent. Five out of the 6 who died developed pulmonary infections, which may be supposed to have been the chief cause of death, although in 2 of them the wound ruptured as well. The sixth apparently died from wound rupture alone. In the other group of patients, numbering 28, who had lost only 3–19 per cent. of their maximal weight, 5 examples of pulmonary infection occurred but were not fatal, while the only death that did occur was due to ileus of mechanical origin.

On such scanty evidence the author's thesis cannot be accepted as a sound conclusion, but as a tentative suggestion it is worth considering. Thyroid surgeons have come to think that a rising weight in a patient with thyrotoxicosis augurs well for a smooth passage in thyroidectomy, and it may well be that slow changes in body-weight, not produced by disturbances in water balance, are a useful indication of the body's general metabolic well-being and of its "resistance." More observations are easily made, and are worth making. But if the thesis should come to be sustained, it is not necessarily to be used as an argument against what Studley calls "the policy of delay in advising surgical treatment of chronic peptic ulcer, . . . now generally followed." It rather points to the need for such pre-operative preparation of the patient as will restore some of his lost weight and strengthen his resistance; except in cases of obstruction, rest in bed and suitable feeding—in some cases perhaps duodenal or jejunal tube-feeding—will often achieve this end, and in the obstructed cases the same thing can be done by means of a preliminary jejunostomy made under local anæsthesia.

MEDICAL OPUSCULES

THE reading supplied in this interesting volume of "Opuscula Selecta" (issued by the *Nederlandsch Tijdschrift voor Geneeskunde*, Amsterdam) is of a varied sort. It is made up of letters interchanged between distinguished doctors of different nationalities

and sometimes between them and their patients, dealing with surgical and medical incidents that may be considered to have formed sign-posts in science. The dates range over the sixteenth, seventeenth, and eighteenth centuries. Dr. M. A. Van Andel points out in an interesting editorial preface that only by such letters could diffusion of medical information take place at a time when very few scientific books were printed and those only at great expense, while during the infancy of printing the suggestion of journalistic production could not have occurred to any mind. Undoubtedly the savants of this grand period in scientific activity exchanged many valuable contributions to knowledge in this manner, and the doctors as well as other leaders of thought were great letter-writers, their patients often being described in the most particular terms. It may be noted, here, that Guido Patin avers that there is as much difference between a doctor's dependence upon information from a distance about the condition of a patient as between Alexander the Great conducting a campaign personally and a king making war through his generals—the difference between conjecture and discovery. The letters throughout abound in theoretic commentaries which to some extent take the place of the clinical conferences of to-day. The authors include, among others, Vesalius, Van Beverwijck, Descartes, Boerhaave, Petrus Camper, and three communications from certain later surgeons are added, among them notes from Diderik Ort and Johan Ramaer to Prof. Tilanus describing cases of gastrotomy. The book is illustrated with pictures of many of these old masters, which are accompanied by biographical notes carefully dated. There is, alas, no index, thus adding to the difficulty of the reader, who will find the languages employed by the writers not necessarily familiar though the letters are furnished sometimes with Latin translations.

NARCOSIS IN ANIMALS AND MAN

THE danger of applying to human beings conclusions drawn solely from experiences with animals was one of the morals drawn by Prof. J. G. Wright when he spoke on the use of non-volatile narcotics at the Royal Society of Medicine last week. His paper, read before the section of comparative medicine on Feb. 26th, showed what great advances the practice of anæsthetics has made of recent years in veterinary surgery. Even for minor operations anæsthesia is now usual, and is generally obtained by the combination of narcosis and local anæsthetics. Slow intravenous injection of Nembutal is a highly satisfactory means of getting narcosis in both dogs and cats. For the horse the enormous amounts required, grs. 200 for example, render this drug impracticable economically. All animals have a natural fear of restraint, which at once puts them into a different category from the average normal human subject. Fear and struggling greatly increase the risks associated with inhalation anæsthesia, and it is in abolishing these that the intravenous use of narcotics has so well proved its value in animal surgery. The excitement sometimes witnessed in narcosis was, Prof. Wright said, hard to explain. It shed some light, another speaker suggested, on the psychological causes attributed to the excitement often witnessed in human patients of certain type after consciousness had been abolished and when it was supposed that the "subconscious" mind had

¹ Jour. Amer. Med. Assoc., Feb. 8th, 1936, p. 453.

assumed uncontrolled sway. Avertin, Prof. Wright believes, is not nearly so satisfactory in veterinary as it is in human surgery. Dr. D. H. Belfrage, who gave a capital summary of the use of the non-volatile narcotics by anaesthetists practising among mankind, expressed a preference, on the whole, for avertin, but approved highly of nembutal for young children. Mr. Basil Hughes thought that by a combination of avertin and local anaesthetics he achieved results in abdominal surgery even better, so far as the post-operative state was concerned, than those claimed by Finsterer for splanchnic analgesia. Mr. Hughes related cases showing the possible danger of Evipan, and claimed good results for the use per rectum of a mixture of magnesium sulphate, paraldehyde, ether, and gum acacia. Sir Frederick Hobday, while admitting the excellent work made possible by newer methods, thought that chloroform properly given still held a big place in veterinary surgery.

FUNCTIONS OF THE PINEAL

A CURIOUSLY indecisive controversy has raged for centuries over the functions of the pineal gland. Indeed, it might well be claimed that there is as much experimental evidence for the view of Descartes, who considered the pineal the seat of the soul, as for that of more modern writers who connect the pineal directly with virility. It has been shown that the organ is not essential to life; the curious syndrome of precocious puberty and somatic overgrowth which has been described in young boys suffering from tumour of the pineal has been variously attributed to hyper- and hypo-function of the gland, while Harvey Cushing has attributed these phenomena to secondary effects upon the pituitary. Experimental extirpation of the pineal gland in animals has led to consistently negative results according to certain workers, and to the appearance of macrogenitosomia and obesity in the experience of others. The results of feeding the organ to young animals have been equally confusing. The evidence is in fact conflicting even as to whether the gland has any endocrine function at all. Rowntree and his collaborators¹ have now recorded the results of injection of a pineal extract prepared after the technique of Hanson, using successive generations of rats. These authors had previously found that continuous administration of thymic extract to successive generations of parent rats had resulted in precocity in the offspring, a method which suggested the present experiment. The pineal extract was injected intraperitoneally, and the offspring of the injected rats were mated in pairs; the offspring of these were also injected. The authors found little effect on the first generation under treatment, but succeeding generations have shown progressively more marked retardation of growth and precocity of development from the third generation onward. The resulting animals were therefore "precocious dwarfs"; in addition to having in early life large genitalia suggestive of those seen in macrogenitosomia præcox, the young animals were of bizarre and characteristic appearance, with "short snout, broad face, round head, heavy jowl, and bulging eye." The authors comment on the high incidence of eye disease in these animals, blindness being common, though usually unilateral. Bilateral cataracts, bilateral anophthalmia, and congenital hypertrophy were also observed. These results, which were obtained on several hundred rats, are of peculiar interest if they

can be proved definitely to be due to a substance present in the pineal; they appear paradoxical when compared with the condition associated with tumours of the pineal—the stimulation of bodily growth and of genital development. Some caution must be exercised in accepting the results obtained as due to the action of the pineal itself, however, since the extract used represented an acid aqueous derivative (probably a picrate) and contained 0.21 per cent. free trinitrophenol, whilst it is perhaps significant that more refined extracts were less active.

RESEARCH IN TROPICAL MEDICINE

THE work of the Medical Research Council has never been restricted by territorial limitations, but hitherto the Council have not been able to assist investigations in the tropics except on isolated occasions, although they have regularly made grants for work at home in relation to tropical problems. An intention to take a more active part in field work is indicated by the establishment announced this week of a tropical medical research committee. The decision to appoint this new committee has been taken by the Medical Research Council in consultation with the Colonial Office. It will give advice and direction in the prosecution of such investigations as the Council may be able to promote, at home or abroad, into problems of health and disease in tropical climates, and make suggestions for research in this field. It will include representatives of the Colonial Office and of the Liverpool and London schools of tropical medicine, with other members appointed as individual experts in tropical medicine or in different branches of medical science. The original members are: Prof. J. C. G. Ledingham, F.R.S. (chairman), Prof. A. J. Clark, F.R.S., Dr. N. Hamilton Fairley, Prof. W. W. Jameson, Dr. Edward Mellanby, F.R.S., Miss Muriel Robertson, D.Sc., Sir Leonard Rogers, F.R.S., Dr. H. Harold Scott, Sir Thomas Stanton, Dr. C. M. Wenyon, F.R.S., Prof. Warrington Yorke, F.R.S., and Mr. A. Landsborough Thomson, D.Sc. (secretary).

NON-SPECIFIC IMMUNITY OF THE PERITONEUM

MANY substances have been proposed and used for inducing a pre-operative increase of resistance to bacterial infection in the peritoneal cavity. Some years ago H. L. Johnson^{1,2} reported that amniotic fluid introduced into the peritoneal cavity reduced the incidence of adhesions after Cæsarean section, and that the fluid increased the resistance of the cavity to infection. The same author and his associates³ now present an extensive survey of this latter phenomenon in dogs. They have used a chemically prepared fraction of bovine amniotic fluid and compare its action with that of papain, sodium merthiolate, sodium ricinoleate, and *Bact. coli* vaccine. The merthiolate and saline alone produced very little response. Papain, which has been used to prevent adhesions, dissolved fibrin and the mesothelial layer of the peritoneum, but induced no beneficial inflammatory reaction. The ricinoleate was apparently toxic. *Bact. coli* vaccine induced a large leucocyte response in the peritoneal exudate and in the blood which reached a maximum in 24 hours and was maintained up to 72 hours. The exudate was heavily blood-stained, extensive hæmorrhage had occurred in the subserous tissues, and the

¹ Rowntree, L. G., Clark, J. H., Steinberg, A., and Hanson, A. M.: Jour. Amer. Med. Assoc., Feb. 1st, 1936, p. 370.

² Surg., Gyn., and Obst., 1927, xlv., 612.
³ New Eng. Jour. Med. and Surg., 1928, cxlix., 661.
⁴ Surg., Gyn., and Obst., February, 1936, p. 171.

cellular response was mainly histiocytic. The amniotic concentrate induced a pink exudate; the maximum white cell response occurred in 12 hours, followed by a rapid fall, and a considerable subserous œdema in the peritoneal tissues was followed by an exudate rich first in polymorphonuclear leucocytes and later in histiocytes. The authors favour the amniotic fluid as giving the classic sequence of inflammatory events, while, for example, the coli vaccine and the papain give a distorted response. There does not seem to be adequate ground for believing that the "classic" is any more beneficial in immunity than the "distorted." However, if we assume that a quick leucocyte and plasma response without much damage to the tissues is required for an increase in peritoneal immunity, the amniotic concentrate is to be preferred to the coli vaccine. Dogs thus immunised were tested by the intraperitoneal inoculation of heavy doses of living *Bact. coli*. The survival rates in the various groups were as follows: 7 out of 8 with amniotic fluid concentrate; 6 out of 9 with coli vaccine; and 5 out of 8 controls receiving saline as an immunising agent. The samples are so small that the figures do not indicate with certainty that either the vaccine or the amniotic fluid concentrate are superior to normal saline in immunising value. At present the prophylactic value of the concentrate depends on reports of its clinical efficacy. This is very hard to assess and a significant improvement in the production of immunity by the use of the concentrate in controlled laboratory tests is required before it can be accepted as an agent for general use.

A NEW INTERNATIONAL CONFERENCE ON DANGEROUS DRUGS

ATTENTION has been called again and again in our columns to the appalling extent of illicit traffic in narcotic drugs. While the International Opium Conventions of 1912, 1925, and 1931 have controlled and regularised the legitimate trade in drugs of addiction, there is indisputable evidence that little or no improvement has been effected in suppressing clandestine manufacture and contraband commerce. At a recent meeting of the Council of the League of Nations an important decision was taken in the right direction. On the motion of M. de Vasconcellos it was resolved to summon a diplomatic conference to consider a draft convention which has been prepared for the suppression of illicit traffic in dangerous drugs. Invitations to the conference will be addressed to all States members of the League and also to Germany, the United States, Arabia, Brazil, Costa Rica, Danzig, Egypt, Iceland, Japan, Liechtenstein, Monaco, San Marino, and the Sudan. The Council appointed M. Limburg (Netherlands) president of the conference, and the first meeting will be held on June 8th of this year. A draft convention, which has been twice submitted to the various governments for consideration and criticism, will form the basis for the deliberations of the conference, but it will be open to the delegates to amend or add to it at their discretion. Lord Cranborne, the representative of Great Britain, took exception to a clause in the draft which had been introduced by the committee of experts. This clause would bind the High Contracting Parties to legislate for the severe punishment of those engaged in the "cultivation, gathering and production in contravention of national law, with a view to obtaining narcotic drugs." Lord Cranborne, while agreeing that to make supervision of the drug traffic effective it was necessary to extend it to the "production" of raw materials, regarded the intro-

duction of the clause in question as premature. To meet this objection, which was supported by M. Massigli, the representative of France, the Secretary-General was instructed to ask the various governments for their observations on the new clause introduced by the experts in time for these observations to be circulated before the assembling of the conference. It is to be hoped that the inclusion of the "production" of raw materials may not lead to the difficulties and abstentions which marred the conferences of 1924-25.

TWIN CORONERS?

OUR learned contemporary, the *Law Times*, has published some judicious articles by way of detailed comment on the report of the Departmental Committee on Coroners. In the third and last of these, which appeared last Saturday, it criticises the Committee's recommendation for the creation of a disciplinary tribunal for coroners and also the proposal to confine appointments to solicitors and barristers. On the latter point it observes that the Committee on Coroners does not advocate the dual qualification in law and medicine. How, asks the writer in the *Law Times*, does the lawyer-coroner read the report of a post-mortem examination? He may have served for years as a deputy coroner; he may have taken a course in forensic medicine and may have studied many text-books. But he will never read a post-mortem report with the seeing eye of the medical man who has passed through the hospitals, conducted his own post-mortem examinations, and spent years in post-graduate practice. The coroner, continues the writer, should be able to test the medical evidence out of his own knowledge and experience; otherwise he is at the mercy of the medical witnesses. If a patient has died under an anæsthetic and there has been some carelessness in a matter on which both surgeon and anæsthetist are silent, is the lawyer-coroner likely to detect the fault? The critic finds another advantage in the medical coroner. In the duties of his office the coroner needs to keep in touch with the big hospitals and their staffs, the police surgeons, and the general practitioners of the district. A coroner who is a medical man can talk to other medical men in their own language. Coöperation will be easier and more sympathetic. Coroners have responsibility in the choice between pathologists, police surgeons, and general practitioners for the performance of post-mortem examinations. The proposed institution of a Home Office panel of pathologists for this purpose is dismissed as inadequate to cope with the widespread needs and emergencies. If the coroner's choice remains, it is best exercised by one with medical qualifications.

Having made these points against the Committee's proposals, the writer in the *Law Times* concludes by submitting his own suggestions. As vacancies gradually create the opportunity, he would reorganise large districts under twin coroners. One of the twins would be legally and the other medically qualified. The legal member would take over all the inquests where no medical issue arose; the medical member, who might be called the "medical examiner," would presumably take the difficult medical issues. It is suggested that excellent results might be expected from the collaboration of the best lawyer and the best doctor available for appointment. That may well be; but would not the advantages of such a partnership be more surely and more smoothly obtained if the appointment was given to a single

person who possessed the dual qualification in law and medicine? This dual qualification is already demanded in some of the most important districts. To the General Council of the Bar it is anathema. Apparently the Departmental Committee of Coroners has in this respect yielded to the organised persuasion of the barristers.

CHARLES NICOLLE

Dr. Charles Nicolle, a distinguished bacteriologist possessing an international reputation, has died in Tunis at the age of 70. He was director of the Institut Pasteur de Tunis for more than thirty years, from 1903 till 1936, and editor of the well-known quarterly *Archives* of the Institute, which he inaugurated in 1906. He wrote extensively on the numerous infectious diseases which are endemic in Tunis and many of his researches are of general importance and of permanent value. Among them his greatest achievement was the discovery of the mode of transmission of epidemic typhus, in recognition of which he was in 1928 awarded the Nobel prize for medicine. It had long been known that under insanitary conditions typhus fever spread rapidly amongst prisoners, soldiers, and vagrants, whereas in well-appointed hospitals the disease did not spread. Only those members of hospital staffs were attacked who were occupied in the receiving-rooms or manipulating the patients' clothes and garments, while the clean patients could safely be attended in the general ward. These facts led Nicolle to suspect the body-louse as the vector of the virus and in 1909, in collaboration with Ch. Comte and P. Conseil, he succeeded in proving the correctness of his conclusion by experiments on monkeys. Body lice (*Pediculus corporis*), which had sucked the blood of a monkey infected by the inoculation of blood from a typhus patient, were shown to be capable of transmitting the disease to other monkeys on which they were subsequently allowed to feed. The far-reaching importance of this discovery was demonstrated in an overwhelming manner during the war, when all the armies adopted louse destruction as the essential means of combating epidemic typhus.

From 1909 and until his very last days Nicolle continued his typhus researches, studying the experimental disease in various animal species and the conditions under which it is transmitted. As a result of his experiments with typhus virus and tame rats and mice he formulated a conception of the so-called "inapparent infection," which he defined as an acute infection with periods of incubation and evolution, followed by cure and immunity, though distinguished from the ordinary type of infection by complete absence of general clinical symptoms. In Nicolle's own view this conception is the most important of his discoveries, applicable not only to typhus but also to other infectious diseases (measles, relapsing fever, dengue). Unfortunately his numerous and varied attempts to evolve an efficient method of active immunisation against typhus infection remained unsuccessful. He found, however, in collaboration with Conseil, that serum from typhus convalescents was of prophylactic value, and in 1918, again in collaboration with Conseil, he made the important discovery of the prophylaxis of measles by means of inoculation of serum from convalescents.

Charles Nicolle's fame will not rest merely on his fundamental researches on the transmission of typhus fever by an insect vector, to wit, the louse. This will certainly remain his paramount achievement, in spite of the fact that recent years have

revealed the existence in various parts of the world of many clinical types of typhus-like diseases, spread by a variety of insect vectors. Outside his typhus work, however, must be placed to his credit and that of his school a surprising number of notable findings and observations in the field of preventive medicine. We may note, for example, his studies on Mediterranean fever, on kala-azar and oriental sore, on trachoma and soft sore, not forgetting his careful observations on the behaviour and fate of the relapsing fever spirochete in the body of the louse. An indefatigable worker, he enjoyed the happy collaboration of a band of highly trained experts. The Tunis Institute, in fact, made it its business to illuminate and so to control just those diseases and plagues by which it found itself surrounded. His office of director of a Pasteur Institute, affiliated with the mother institute in Paris and sharing the latter's traditions, he rightly magnified. Only a month ago there appeared in the *Archives* of his institute a long and reasoned article from his pen on the responsibilities of the ideal director of an institute for research in experimental medicine. How is the ideal person to be selected and by whom? By a committee or by a person? When selected and placed in office, what should be his guiding principles in every sphere of his relationships? A pathetic and perhaps prophetic interest attaches to his concluding hints on the training of a successor, a duty that no director, in Nicolle's view, should shirk, if circumstances permit. So studied and ever-progressive should this training in responsibility be, that when the chief comes to retire or die, the change over should take place almost "physiologiquement."

MEASUREMENTS OF RED CELL SIZE

THE Sidney Ringer memorial lecture was delivered at University College Hospital on Feb. 28th on the Measurement of Red Cell Size, by Dr. Cecil Price-Jones. He outlined his technique of measuring red cells and the statistical methods employed to estimate the mean diameter, the degree of anisocytosis, and the degree of microcytosis and megalocytosis shown by the red cells in any sample of blood. He described clearly the normal red cell distribution curve, the factors, such as exercise, that may influence this curve, and the variations from the normal found in pathological conditions.

In introducing the lecturer Dr. Charles Bolton voiced a general feeling in saying that, like Sidney Ringer, Price-Jones had made a remarkable and fundamental contribution to medical science. Ringer's solution and Price-Jones' curves had both become familiar and essential aids to further knowledge of certain physiological and medical problems. Price-Jones has not only devised an invaluable method of studying abnormalities in red cell size but has also determined what the limits of normal variation may be both in size and anisocytosis. These limits are calculated on sound statistical principles and are not the result of a small group of observations only. The method of Price-Jones is admittedly time-, if not temper-, consuming, but it has the extreme advantage over most other methods that the limits of normal variations in cell size determined by the method are known. Mean corpuscular volume can also be used as a measure of cell size. Price-Jones and his colleagues¹ have recently determined the normal limits of variation in cell volume by the method of

¹ Price-Jones, C., Vaughan, J. M., and Goddard, H.: *Jour. Path. and Bact.*, 1935, xl., 503.

Wintrobe. The method is quick, accurate, and easily carried out. It will probably prove the method of choice in the future for estimating cell size in routine investigations. It has however the great disadvantage that it gives no expression to the degree of anisocytosis present in the sample. Increase in anisocytosis is a more delicate measure of variation from the normal than increase or decrease in mean corpuscular size. For research purposes a method that estimates both cell size and anisocytosis is essential. Pijper² claims that his new diffraction apparatus will give reliable measurements both of diameter and anisocytosis; its great advantage is the speed with which results can be obtained; it should be a useful aid in the routine laboratory, especially when the limits of normal variation by this technique have been determined on statistical principles. No diffraction method, however, will give mathematical expression to the degree of microcytosis and megalocytosis present. Though diffraction methods of a refined type and estimations of cell volume may have their value in routine blood examinations, at present the Price-Jones' technique, especially when used in conjunction with Wintrobe's method of volume estimation, stands alone as a method sufficiently accurate for research purposes. It has already achieved, in the hands of its originator, results of fundamental importance.

FOG AND FILTHY AIR

THE public is loudly exhorted in the daily press to become air-minded; and we hope that its new air-mindedness will include concern at the condition of the air. The twenty-first annual report on investigation of atmospheric pollution, issued by the Department of Scientific and Industrial Research,³ shows that the air over the country generally is not becoming cleaner; at least it is not becoming cleaner at those places where deposit gauges have been installed long enough for comparisons. Out of 57 such places only 5 show improvement during the year ended last March. Nor is this the whole tale; for a survey by Mr. B. H. Wilsdon shows that in the past twenty years the amounts of insoluble matters deposited have shown no progressive improvement, although the soluble matters lessened during the first eight years of the investigation. Last year the incidence of days of fog haze, when the soot stain produced by filtering air through paper reached a depth corresponding to over 2 lb. of soot in a cube of air with 100-yard sides, was very variable in places where Owens' air filter records were taken. In London only 19 such "Z" days were recorded at South Kensington and Westminster Bridge, whereas at Victoria-street 52 were noted and at Westminster City Hall 115. At Kew there were 15, at Cardiff none, at Coventry 22, at Stoke-on-Trent 141, and at Edinburgh 68. The irregular distribution over the small area of London covered by filter records is consistent with common experience of the patchy incidence of fogs.

Particular attention has been devoted of late years to the sulphur content of the air, determinations being made at many stations of either the actual volume ratio of sulphur dioxide in air—which is of the order of less than 1 in a million—or of the weight of active sulphur dioxide absorbed by an area of 100 sq. cm. of a lead peroxide surface exposed under a hood protecting it from rain and renewed after a

month's exposure. In all places the variation from month to month is conspicuously seasonal, sulphur, like all polluting matters except those which are insoluble, being in greater amount in air in winter than in summer; but in London, as well as other towns, the amounts in both summer and winter are large, suggesting either that the domestic coal fire is widely continued through the summer or that the southward movement of industrial undertakings is having its effect on London air. This latter view is put forward by a member of the research committee, Mr. J. H. Coste, chemist to the London County Council. Whether it adequately explains the high sulphur content of London air it is difficult to judge; but the annual consumption of coal in the metropolis is very large and there is little reason to suppose that this coal is of specially low sulphur content. So far as we know, the undertakings in London which take steps to remove sulphur from flue gases can be counted on the fingers of one hand.

EARLY DIAGNOSIS OF PULMONARY TUBERCULOSIS

A FEW months ago we referred¹ to the work of Dr. Jacques Arnaud, medical director of the Sanatorium Grand Hôtel du Mont Blanc. It may be recalled that his prescription for the early diagnosis of pulmonary tuberculosis was systematic, periodical radiographic examination of the whole community. The same plan is now recommended independently by another tuberculosis specialist in another country. In *Tidsskrift for den Norske Laegeforening* for Feb. 1st, Dr. H. J. Ustvedt passes in review 321 patients examined in the Ullevaal Hospital in Oslo, and gives the duration of the symptoms of these patients before they submitted to a medical examination. It seems that only 83 of them came to examination within a fortnight of the first appearance of symptoms, and that the latent period was three months or more in the case of another 83. Though cough and fever may mark the onset of the disease for the patient, they represent in the eyes of the clinician and pathologist comparatively late stages of an infection which may date back many months, and the disease will be recognised early only when it is sought among persons believing themselves to be perfectly well. Ustvedt therefore recommends Pirquet tests followed by X ray examination of the positive reactors. This system has already been started tentatively in the homes of the tuberculous in Norway, and in Oslo medical students are thus systematically examined with the same object. The procedure is shortly to be extended to other groups so that students in all the faculties can enjoy its benefits. With regard to tuberculin tests, it is curious that whereas in Denmark and Sweden the Pirquet reaction has been found to be so inferior to the Mantoux reaction that the latter is now given the preference in wholesale tuberculin examinations, Norwegians still cling to Pirquet, being convinced that, when it is practised lege artis, it yields figures within 90–95 per cent. of Mantoux figures with 1 mg. of tuberculin. In the other Scandinavian countries comparisons of the two reactions have been much less flattering to Pirquet. These intra-Scandinavian discrepancies may reflect want of uniformity of technique, or, as Ustvedt believes, the fact that bovine tuberculosis exists in Denmark and Sweden but is almost non-existent in Norway.

² Pijper, A.: THE LANCET, 1935, i., 1152.

³ London: H.M. Stationery Office. 1936. 5s.

¹ THE LANCET, 1935, ii., 1123.

PROGNOSIS

A Series of Signed Articles contributed by invitation

XCI.—PROGNOSIS IN SPINAL CARIES

PROGNOSIS in spinal caries depends (1) on the natural resistance of the patient, (2) on the method of treatment adopted, and (3) eventually on complications and the degree of deformity remaining. The disease may occur at any age and is most dangerous in weakly infants with bad family history, in whom the danger of tuberculous meningitis or general dissemination is very real. There is much controversy as to the relative values of extreme conservatism without operation and conservative treatment assisted by bone-grafting or bone-fusing operations of that part of the spine affected. The position is, briefly, that properly applied conservative treatment with rational orthopædic measures but without operation is certain of considerable success, but that treatment may be shortened in selected cases by operative measures. Immediate mortality is undoubtedly least when careful non-operative conservative treatment is alone applied. Patients with severe deformity, which incidentally should never arise if early treatment is undertaken, have a lessened hope of longevity from mechanical reasons which predispose to death from complications such as pneumonia. Such patients however can hardly be helped by operative treatment.

Below are tables giving mortality statistics of all my own cases treated at Treloar Cripples' Hospital from September, 1908, to March, 1935, but excluding cases in private practice or treated at any other hospital with which I am associated.

SPINE

Total number of cases admitted during the period	1666
Cases discharged to March 31st, 1935	1582
Deaths to March 31st, 1935	61 (3.8%)
Average stay in hospital of fatal cases	410 days.

Causes of Death

Miliary T.B. and meningitis	32 (2.02%)
Sepsis and amyloid disease	16 (1.01%)
Other causes	13 (0.82%)
Diphtheria	1
Morbus cordis	3
Nephritis	1
Ketosis	1
T.B. carditis	1
Post-operative shock (laminectomy)	1
Pneumonia	1
Broncho-pneumonia	1
Influenzal pneumonia	1
Intestinal obstruction	1
Hæmorrhagic measles	1

Age-periods.	Deaths.	Average stay in days.	Miliary T.B. and meningitis.	Sepsis and amyloid.	Other causes.
1-5	26	257	19	2	5
6-10	26	592	11	8	7
11-16	9	466	2	5	2

Relative Frequency of (a) Miliary T.B. and Meningitis, and (b) Sepsis and Amyloid Disease as Causes of Death at Different Age-periods in Spinal Caries

Age	1-5	6-10	11-16
Miliary T.B. and meningitis (per cent.)	73.1	42	22.2
Sepsis and amyloid (per cent.)	7.7	30	55.6

Summary

Total admitted.	Total discharged.	Total died.	Average stay in days of fatal cases.	Death percentage.
Spine 1666	.. 1582	.. 61	.. 410	.. 3.8

Mortality is highest in the age-period 1-5 and the commonest cause of death in this age-period is menin-

gitis and general tuberculous dissemination. As age increases the danger of meningitis diminishes, but deaths from sepsis increase. Other causes may be almost disregarded, as they are incidents arising in any child's life though naturally more serious in a child already infected with tuberculous disease.

This comparatively low mortality in children, many of whom arrive for treatment with advanced disease, often complicated by abscess or sinus formation and sometimes paraplegia, may be ascribed to the rigid conservatism practised under exceptionally good climatic and hygienic conditions. In children I am definitely opposed to stabilising the spine by bone-grafting or fusing while the disease is active and consider such operations not generally indicated when the disease is arrested. An exception to this rule occurs in the case of children of poor musculature where it may not be possible to supervise efficient splinting over a sufficiently long period after discharge. In such cases rapid increase of deformity may arise, which might be avoided by osteo-synthesis.

In adolescents and adults Albee's operation (or some modification) for stabilising the spine is increasingly popular amongst many surgeons as an alleged means of reducing the period of treatment for and the danger of later increase of deformity or recurrence of the disease. The mortality is undoubtedly raised in those submitted to operation unless patients are carefully selected, guarded from intervention in the acute and progressing stage of the disease, and made to take adequate rest over a sufficiently prolonged period.

These operations will not with certainty arrest the disease and in the course of my work I have been impressed by the large number of patients I see who had been discharged too soon and in whom abscesses or paraplegia had compelled return to institutional treatment, often without the knowledge of the surgeon who performed the operation.

COMPLICATIONS

The presence of a *closed tuberculous abscess* associated with a tuberculous lesion of the spine is of little moment if it can be successfully aspirated and secondary infection or sinus formation avoided. If secondary infection occurs the outlook is grave. Free drainage is essential and immediate treatment with autogenous vaccines at this stage is helpful. All too often, however, fever and toxæmia enfeeble the patient, the course of treatment frequently becomes long and tedious, and amyloid disease may follow. In the latter case, the prognosis is definitely bad, though I can recall a few such patients who have recovered. Secondarily infected sinuses often heal with extreme difficulty, some never heal, and then the patient may recover or survive for many years with discomfort and often, though not necessarily, in a state of chronic invalidism.

An abscess is a serious complication when it forms in the region of the spinal canal and when by reason of the pachymeningitis it produces, or by direct mechanical pressure, it involves the spinal cord. The mid- and upper dorsal regions of the spine are the commonest situations. Of 134 cases of paraplegia occurring at the Treloar Cripples' Hospital, 14 are still under treatment, 5 died, 6 were removed, 24 were unimproved, and 85 were discharged walking after conservative treatment.

Paraplegia from true tuberculous pachymeningitis is a late manifestation; its onset is insidious, it tends to progress rather than resolve and the prognosis is bad. Of 26 such cases included in the total of 134, 12 recovered, 11 were unimproved, 2 were removed, and 1 died.

DEFORMITY

The prevention of deformity, or its correction, if that is possible, should be an essential aim in treatment. Both may be ensured in a large number of cases if the patient is immobilised, hyperextended, and treated at first and for many months in the dorsally recumbent position. The cervico-dorsal region of the spine is the most difficult one in which to prevent or correct deformity, and if much deformity exists before effective treatment is initiated, correction is almost impossible. The prevention or attempted correction of deformity should be urged not only on aesthetic grounds, but because with much kyphosis there is embarrassment and displacement of the viscera, especially the thoracic viscera, with consequent distress to the patient and liability of intercurrent, especially respiratory, disease. A strong dorsal musculature is of great assistance in maintaining the spine erect, and for that reason open-air treatment and back-raising exercises with the patient prone are of especial value in the last stages of institutional treatment. Efficient after-care and well-applied and fitting spinal jackets are of immense importance

at this period, and in cases of weakened muscles spinal osteosynthesis has its most important indication.

ASSOCIATION WITH OTHER TUBERCULOUS LESIONS

Occasionally, though rarely, one finds patients who will fail to respond to any form of treatment and in whom other lesions develop. For these, prospects of recovery are poor, though, at times, from some reason, possibly a suddenly acquired immunity, progress of the disease is checked and recovery follows.

In children, multiple lesions associated with spinal caries lengthen the period of treatment required but do not usually jeopardise cure. Associated pulmonary tuberculosis is a serious but not unconquerable complication, and I have known adults who, as the result of acquiring spinal caries following pulmonary tuberculosis, have recovered completely from both, largely as the result of the enforced rest which the spinal lesion necessitated.

I am indebted to Mr. H. H. Langston, R.M.O., at the Treloar Hospital, for collecting and analysing the incorporated statistics, and to Dr. Churchill, late R.M.O. to the hospital, for the analysis of the paraplegia cases which is discussed fully elsewhere (*St. Bartholomew's Hosp. Jour.*, October, 1935).

HENRY GAUVAIN, M.D., M.Chir., F.R.C.S.,
Medical Superintendent of the Lord Mayor Treloar
Cripples' Hospitals, Alton and Hayling Island,
and of the Morland Clinics, Alton.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdrs. H. H. Babington to *Pembroke*, for R.N.B., Chatham, and as Ophthalmic Specialist; M. Brown to *Victory* for Haslar Hospl.; and O. D. Brownfield, O.B.E., to *Pembroke* for R.N. Hospl., Chatham.
Surg. Lt. (D) S. R. Wallis to *Pembroke* for R.N.B.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt.-Comdr. R. B. H. Wyatt placed on the Retd. List.
Surg. Lt. C. J. T. Watson to *Curacoa*.
Surg. Sub-Lts. J. A. Shepherd to *Royal Sovereign*, and R. F. B. Bennett to *Victory* for R.N. Hospl., Haslar.
Proby. Surg. Lts. to be Surg. Lts.: A. B. Concanon, W. G. Gill, and N. A. Vernon.
Proby. Surg. Sub-Lt. G. S. Irvine to be Surg. Sub-Lt.

ARMY MEDICAL SERVICES

Lt.-Col. S. W. Kyle, R.A.M.C., to be temp. Col. whilst empld. as A.D.M.S., 5th Div., Jan. 10th, 1936. (Substituted for notification in the *Gazette* of Feb. 4th.)

ROYAL ARMY MEDICAL CORPS

Short Serv. Commissions: Lt. B. d'E. Barelay to be Capt; Lt. (on prob.) A. H. T. F. Fullerton is restd. to the estab. and is confirmed in his rank; and R. E. Waterston to be Lt. (on prob.).

REGULAR ARMY RESERVE OF OFFICERS

Col. E. W. Powell (late R.A.M.C.), having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

TERRITORIAL ARMY

Capt. A. N. B. Odbert to be Divl. Adj. 46th (N. Mid.) Div., vice Maj. H. A. Rowell, M.C., vacated.
Lt. P. Spence to be Capt.

The King has conferred the Efficiency Decoration upon the undermentioned officers under the terms of the Royal Warrant dated Sept. 23rd, 1930: Lt.-Col. J. P. Clarke, Lt.-Col. J. B. Scott, M.C., Maj. A. H. D. Smith, M.C., Maj. A. G. Williams, O.B.E., Maj. P. Lloyd-Williams, Maj. C. W. Healey, M.C., and Maj. James Duncan Hart, M.C. (deceased).

TERRITORIAL ARMY RESERVE OF OFFICERS

Lt. A. Menzies, from T.A. Res. of Off. (9th Bn. A. and S.H.), to be Capt.

ROYAL AIR FORCE

Squadron Leader T. J. X. Canton to R.A.F. Station, Manston, for duty as medical officer.

Flight Lt. J. Hutchieson is promoted to the rank of Squadron Leader.

Wing Comdr. J. Rothwell is placed on the retired list at his own request.

Flying Officer S. R. C. Nelson to No. 6 Flying Training School, Netheravon.

Dental Branch.—Flight Lt. J. E. Willoughby, L.D.S., relinquishes his non-permanent commission on account of ill-health.

INDIAN MEDICAL SERVICE

Capt. G. J. Joyce to be Maj.

DEATHS IN THE SERVICES

The death occurred at Tunbridge Wells on Feb. 27th of Surgeon Captain JOHN EDWIN COAD, R.N., retd. He qualified M.B. Durh. 1885 and M.R.C.S. Eng. 1886, having been educated at Newcastle-on-Tyne and St. Thomas's Hospital, London. In 1887 he resided at York and soon after joined the Navy. In 1899 he was appointed Staff Surgeon in *Barracouta*, a twin-screw cruiser, Cape and West Africa Service, attained the rank of Fleet Surgeon in February, 1903, and retired with the rank of Surgeon Captain in July, 1917, receiving a medal for war service.

LONG RECORD OF HONORARY SERVICE.—At a meeting of the executive committee of Worcester Royal Infirmary to consider the appointment of a successor to Mr. Mark Bates, who is an honorary surgeon but is undertaking other work at the hospital, it was stated that the Bates family had in all given 77 years of honorary service to the hospital. The late Mr. Tom Bates gave 37 years' work, his son, the present senior surgeon, has given 27 years, while Mr. Mark Bates has given 13 years.

SPECIAL ARTICLES

IVAN PETROVITCH PAVLOV

DURING the last twelve months of Pavlov's life probably more people who were interested in his work had the privilege of seeing him and hearing him speak than in any other year. The summer of 1935 is memorable both because of his visit to this country for the International Neurological Congress and because of the holding in Russia of the International Physiological Congress. The name of the great physiologist dominated these gatherings, which were attended by representatives from all over the world, and their chief interest to many lay in the opportunity to "see Pavlov." Those who met him on these occasions must count themselves fortunate, for he died in Leningrad on Feb. 27th, at the age of 86.

Pavlov was born in September, 1849, in the small city of Riazan in Russia. His family were poor, but his father was a country priest and the foundations of his education were laid in the church school from which he passed to the theological seminary. It seems that this differed from other schools in that the boys were encouraged to develop their natural inclinations instead of being forced up to the same standard in all subjects. Pavlov became interested in the natural sciences, and at the age of 21 entered what was then St. Petersburg University, and studied under Mendeleef and other eminent teachers.

Later, in the Medico-Chirurgical Academy, he came in contact with von Cyon whose stimulating personality had much to do with determining his future career; and after graduation in 1879 he continued research work in the Military Medical Academy under the physician Botkin, obtaining the degree of M.D. in 1883 for a thesis on the efferent nerves to the heart. In 1884 came the opportunity to go abroad, and when he returned to his former position two years later his experience had been enriched by work done in the laboratories of Ludwig and Heidenhain.

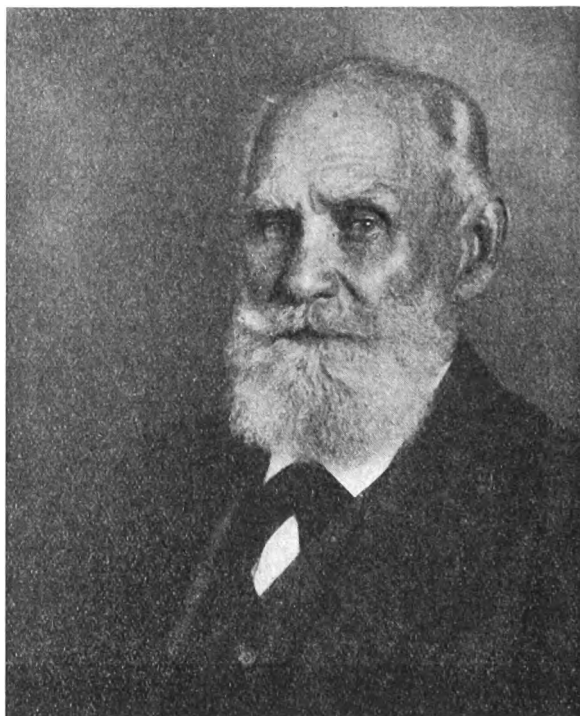
Thereafter followed his classical contributions to the physiology of digestion, and by 1897, when he published a monograph on the subject, his reputation was international. Meanwhile, at the age of 41, he had been appointed professor of pharmacology in the Medical Academy, and then to the chair of physiology in the new Institute of Experimental Medicine, built by Prince Alexander of Oldenburg. In 1897 he obtained the chair of physiology in the Medico-Chirurgical Academy, relinquishing his professorship of pharmacology, but he still retained his other two posts when, in 1907, he was appointed one of the four scientific members of the St. Petersburg

Academy of Sciences, and therefore had charge of three laboratories. Most of his personal research was done in the Institute, now known as the All-Union Institute of Experimental Medicine, of which he was latterly honorary director, as well as director of physiological laboratories in the Russian Academy of Sciences.

Although Pavlov emerged after the revolution in more or less the same posts as he had held previously, he suffered more than a change of titles during that difficult time. "Like other scientists he suffered much . . . having to carry on his experiments without heat or light, and drawing his main food supply from a little patch of potatoes which he tended himself. But his only complaint was that,

with other members of the Academy of Sciences, he had to take his turn in guarding firewood stacked outside the Academy for six hours at a stretch."¹

Pavlov, however, was no stranger to hardship and was enabled to survive this period of drudgery and want which must have recalled his earlier struggles. Until he obtained his first professorial post his life had been a continual battle with poverty and difficulties which to a lesser man would have been insurmountable. The animals he used for his researches into the circulation and for his earlier experiments on digestion were tended by himself and his wife in their own home, and comfort was sacrificed to the thoroughness upon which he insisted in every branch of his work. During his second period of adver-



sity he made no secret of his disapproval of the prevailing régime and its principles, but he was treated with tolerance and later received at the hands of Lenin every encouragement and opportunity to pursue his important work. It would be ungenerous to analyse the motives for this policy, which was never varied up to the time of Pavlov's death. Last year, on his 85th birthday, he was given a pension of 20,000 roubles, and a million roubles for his laboratories. He had but little interest in politics as such, and it is said rarely read a newspaper. He criticised the government in so far as they made academic appointments on political grounds, and more fundamentally because he believed the philosophy they adopted to rest on a faulty biological basis; nevertheless, in his welcome to the Physiological Congress last year he fully identified himself with the policy of his country.

Long after these details of Pavlov's eventful career have been forgotten his contributions to medical science will perpetuate his name. In the space of ten years he reduced the unexplored field of digestive secretion to an orderly pattern of reflexes,

¹ The Times, Feb. 23th, 1936.

and definitely established the value of applying to physiology the methods of aseptic surgery. His fistulæ were carefully made, and the scrupulous after-care of the animals enabled him to keep them alive until they were, to all intents and purposes, restored to normality. The influence of experimental conditions upon his observations was reduced to a minimum. The importance of his famous operation for separating off a pouch from the stomach, in which the gastric secretion could be studied uncontaminated with food, rested upon the "normality" of the pouch. Its nerve- and blood-supply were left intact, and no detail was overlooked which would serve to make it in all respects a faithful miniature of the stomach itself. Pavlov never made the mistake of forgetting that the organ he was studying was but a part of the whole animal, and that if this was not in perfect condition the conclusions would be subject to all manner of reservations. He worked out in great detail the responses of the salivary and gastric glands to the sight, smell, and taste of food, and showed how the type and quantity of secretion could vary with the kind of food administered.

THROUGH PHYSIOLOGY TO PSYCHOLOGY

It is noteworthy that although Pavlov's work had been directed up to this time towards problems concerning the circulatory and digestive systems, he approached them from the point of view of their nervous control. In 1902 Bayliss and Starling demonstrated the copious secretion of the pancreas in response to the hormone secretin, and Pavlov had to revise many of his conclusions in view of this hitherto unsuspected mechanism for coördination. He foresaw that development for the next few years would be likely to be along chemical lines, and it is probable that his disinclination for this type of work was one of the factors which turned his attention to the nervous system itself.

At all events, the next thirty years saw a direct attack on the physiology of the cerebrum whose results transcended in importance anything which Pavlov had yet done. He noticed that an organ could be activated reflexly not only by its normal stimulus, but, under certain circumstances, by all kinds of stimuli not usually associated with it. Thus if a dog was always fed in a routine manner by the same attendant, dressed in the same way, it would begin to secrete saliva before tasting the food, and also when the attendant came without food. In other words an entirely new reflex—a conditioned reflex—had been laid down, the sight of a particular person becoming an adequate stimulus for the secretion of saliva. A salivary fistula enabled Pavlov to assess the quantitative value of the response by measuring the rate of secretion, and he showed how this could be brought about by stimuli applied to any sense-organ. Once the method of producing conditioned reflexes had been established, the next step was to investigate their properties—how they were modified by intercurrent stimuli and the laws determining how they could be reinforced, destroyed, or inhibited. The fruitfulness of experiments on inhibitory phenomena alone was surprising, and Pavlov showed, among other things, how inhibition could be built up so strongly as to produce sleep.

The technique of the experiments is further illustrative of Pavlov's genius in obtaining reliable information about a single organ from the intact animal. This time the problem was not surgical, but rather one of designing apparatus and perfecting routine. The brain was "isolated" by keeping the animal under absolutely constant conditions and

ensuring that the experimental stimuli to which it was subjected were the only unusual events in its life. This required extraordinary precautions including the building of special laboratories and the rigid training of assistants. It might have been contended, with some show of reason in regard to his earlier experiments on digestion, that Pavlov owed his success to his amazing manual dexterity and operative technique, which were the envy of his assistants. In considering his work on conditioned reflexes, however, it becomes apparent that the factor determining the outcome of his researches was always his method of attacking a problem. His life was literally devoted to the search for truth, and in achieving his ends he used no instrument which he had not perfected to the highest possible degree. "A superb experimenter, combining the talent of a magnificent surgeon and a shrewd observer; a dynamic lecturer, surpassed only perhaps by Maximot in logic and the use of language; a powerful thinker, never interested much in priority, never influenced by any authority, he understood only the logic of facts."²

It is unnecessary nowadays to stress the value of this objective method of approach in the study of the mind. Pavlov believed that all acquired habits and training depended on chains of conditioned reflexes, and that his experiments on dogs provided the clue to the type of activity taking place in the human cortex. By comparing the reactions of different animals to his experiments, the readiness or otherwise with which they formed conditioned reflexes, and the subsequent stability of the reflexes, he was able to divide dogs into four groups which bore a close resemblance to the "choleric, phlegmatic, sanguine and melancholic" temperaments of man. By associating one kind of response with a conditioned stimulus of certain characteristics, and an incompatible type of response with a closely related but slightly different stimulus, he trained his dogs to an astonishing pitch of discriminative ability. If overtaxed, for instance by persistently having to differentiate between two musical notes varying by only a few vibrations, they broke down and became definitely neurotic, losing temporarily all vestige of their training. Inhibitory reflexes were always the greatest sufferers under such conditions.

Clearly this was leading Pavlov into the realms not only of normal but of abnormal psychology. He related the original "type" of dog to the disturbance most likely to develop, and was able to produce states analogous to hysteria, catalepsy, and many of the neuroses and psychoses. Visitors to Leningrad last year were able to see the groups of orphan babies whose development he was observing, and the patients he was investigating in the Psychiatric Polyclinic where he had charge of 25 beds.

A LEGACY TO SCIENCE

The logical development of Pavlov's work has never faltered, and at the time of his death he was the centre of a vast and still growing organisation of research which had sprung from his first modest experiments. It is doubtful whether the usefulness of the methods he has introduced will ever be exhausted, while the results so far attained have already made a permanent impress on several branches of learning, including some previously immune to experiment.

² Stavraky, G. W.: Arch. Neurol. and Psychiat., 1935, xxxiii., 1082. Most of the biographical data in the present sketch were obtained from this account of Pavlov's life. The photograph was taken at the Rockefeller Institute, during a visit to New York, by Mr. Louis Schmidt.

His powerful, yet lovable personality, will not be forgotten by those of the present generation, while the intense loyalty and admiration he evoked in all who worked with him bids fair to make that personality legendary. Known in every civilised country in the world, he was awarded many foreign and international distinctions, including the Nobel Prize in medicine and physiology in 1904. In this country he was a foreign member of the Royal Society, whose Copley medal was given to him in 1915, and an honorary fellow of the Royal College of Physicians.

MEDICINE AND THE LAW

The Nottingham Nursing-home Trial

Nurse Waddingham, an unregistered nurse, was found guilty last week of the murder of Ada Baguley at a home carried on at Devon-drive, Sherwood, Nottingham. In the organs of the dead woman's body $4\frac{1}{6}$ grains of morphine hydrochloride were found. One grain was a possible fatal dose. The jury may well have been satisfied that Ada Baguley died on Sept. 11th of morphine poisoning: they had also to be satisfied that the accused administered the morphia and administered it with intent to murder. A will made by the deceased on May 7th in favour of the accused was suggested as a motive. When told, on Sept. 24th, that morphia had been found in the body, Nurse Waddingham said: "I have never given Miss Baguley any morphia: I have never had any in the house. . . . Apart from the medicine prescribed by the doctors and aspirin, she has had no other medicine." Later she admitted that she had morphia, but she said that Dr. Manfield (the deceased's medical attendant) had prescribed it and she had not mentioned the fact because he asked her not to. This statement Dr. Manfield denied. There was a further vital conflict of evidence between the accused and the medical attendant. The accused said that on August 27th Dr. Manfield gave her 6 tablets which she knew were morphia. Dr. Manfield said that he did not and that there was nothing in the patient's condition which would lead him to leave morphia at the home. Inasmuch as the defence contended that the accused administered the morphia to alleviate violent pain, it was important that Dr. Jacob, who had attended Miss Baguley previously, visited the patient in the third week of August and saw no reason to prescribe morphia. The drug indeed, according to the accused, was mentioned for the first time on August 27th. She said that on Sept. 2nd Dr. Manfield gave her 4 more tablets of morphia, without being asked and without asking whether she had used any of the previous 6. Dr. Manfield denied this too. Nurse Waddingham said she had given the first two tablets to the deceased on Sept. 7th. She said Miss Baguley had been poorly from some date in August and one of the symptoms was a severe abdominal pain. She gave the morphia tablets for three nights because Ada Baguley suffered sharp abdominal pains, yet on Sept. 10th she cooked her a heavy meal of pork (two helpings), baked potatoes, kidney beans, and fruit pie. The patient died next morning. Dr. Manfield was sent for: he found the body still warm: rigor mortis had not set in. He certified cerebral hæmorrhage as the cause of death. This, as the post-mortem examination showed, was wrong. Mr. Justice Goddard remarked that no blame could here be attached to the doctor for the error. If a patient dies of a stroke,

the doctor can act on what he is told and he can but ask those who were present at the death and form his own opinion. The doctor was dealing with a patient suffering from a disease with which apoplectic disorders could be connected, and he was told that she had suffered from strokes before. There were, as the judge observed to the jury, many points at which the evidence was in Nurse Waddingham's favour. The inconsistencies in her story and the conflict between her evidence and that of Dr. Manfield seem to have established her guilt.

One point of special significance was the introduction of evidence that Ada Baguley's mother, an inmate of the same home, had apparently died of a poisonous dose of morphine. Dr. Roche Lynch described the discovery of pseudomorphine in her exhumed body. How was this evidence of another death legally admissible on the charge in respect of Ada Baguley alone? We noted in this column a few weeks ago the case of *R. v. Mortimer*, where a soldier who stole a car ran down a girl on a bicycle and was charged with murder. Although strictly the witnesses should have spoken only of this incident, the court admitted evidence that, earlier and later, the soldier had driven the car at other people on bicycles. These facts were held to be admissible in order to show systematic purpose and to negative the defence of accident. So also in the Baguley trial the evidence of a parallel case was allowed in order to prove intent. The jury was warned (for what such warnings may be worth) that the evidence of Mrs. Baguley having died of morphine poisoning was not to be accepted by them as showing that Nurse Waddingham was a woman who poisoned other people. The evidence of the mother's death was material, said the judge, only in this way—if the jury thought the administration of morphine to the mother might not have been innocent, they could ask themselves whether the giving of the drug to the daughter was done with the innocent intention to relieve pain or with the criminal intention of taking life. Whether juries can master these subtleties or no, such is the law. The same point arose in the *Armstrong* case in 1922. On a charge of murder by arsenical poisoning in the month of February, it was proved that the prisoner had arsenic in his possession both before and after that date. His defence was that death was due to suicide and that his possession of arsenic was for the innocent purpose of killing weeds. Evidence that he tried to poison somebody else with arsenic in October was held admissible as tending to show that the possession of the weed-killer at the earlier date was not for an innocent purpose.

There is to be an appeal in *R. v. Waddingham*. It has been stated in the daily press, on the authority of the solicitor for the defence, that one ground of appeal will be the fact that the judge told the jury it was either murder or nothing and did not deal with the possibility of manslaughter through the negligent administration of morphia to the patient. The discussion on this and other points must be awaited.

Hospital's Liability for Child Patient

A verdict of £500 damages (with costs) was entered last week against the Rochester and Chatham Joint Hospital Board, as managers of St. William's Hospital, Rochester, in an action for damages for personal injuries to a child patient. A boy of 7 was received in the scarlet fever ward on the ground floor. On the afternoon of his first day in the ward, having been placed in a bed a few feet from a window, the lower part of which was open, he somehow sustained

injuries by falling out of the window to the ground below, a distance of about 17 ft. He suffered from shock and was kept three weeks longer in hospital; his forehead was disfigured and both feet are now flat and require special supports. The boy's father, who brought the action, said the hospital and its staff were negligent in leaving the patient unattended near the open window. The defendants denied the allegation and alternatively contended that, if they had been negligent, the child had jumped out of the window in the endeavour to return home, taking the risk of the jump and contributing by his own negligence to any harm which he received. The verdict of the jury indicates that they did not accept the contention of contributory negligence.

There are interesting legal decisions on the question whether, or how far, a child is capable of negligence. *Lynch v. Nurdin* (1841) is the classic case. An egg-merchant's cart was left unattended beside the pavement in Compton-street, Soho. Children played with it. One little boy was climbing into the driver's seat when another little boy tugged at the horse's bridle. The first boy consequently fell and was injured; his father successfully claimed damages and it was considered that the child had not been guilty of contributory negligence but had merely obeyed a child's natural instincts of play. The inference is that a child in such cases is to be judged as a child and must not be expected to have the mature judgment of a grown-up person. On the other hand he may be unable to recover damages if he has done what he knew to be naughty. The jury must consider his age and his ability to look after himself. Where a machine for oil-cake crushing was left standing in the street with the handle not fastened up and some schoolboys played with it, one turning the handle while another thrust in his fingers, the owner of the machine was held not liable. This decision has been severely criticised. Modern cases are more sympathetic to the child, where the object is dangerous in itself, especially when it offers some allurements to the infant mind. Special considerations arise where the child meets its injuries while trespassing. The Central London Railway, for instance, had a moving staircase in a booking-hall close to the street. It attracted children from the street, who were frequently driven away. One child was injured while thus trespassing and the court held that the company was not liable. As regards the duty of hospital staff to foresee the natural temptations of an open window near a child's bed, the same duty would presumably exist in the case of an adult patient of known abnormality of mind.

Fines for Dangerous Drugs Act Offence

Last week the Marylebone magistrate imposed fines amounting to £150, with 30 guineas costs, upon a physician and surgeon for failing to keep records as required by the Dangerous Drugs Regulations. The prosecution concerned 398 grains of morphine sulphate. It was said that the defendant had given one woman 190 grains at one time and another person 72 tubes. Both these patients were known to be drug addicts. It was further said that the prescriptions showed that the doctor, rather than reduce the dosage, had been increasing it; 1 grain had been increased to 7 or 10 grains in a few months. Counsel for the defence submitted that the large supply in one instance had been for a patient who was going on a cruise. The magistrate said it was a case of such gravity that, if the money was not paid by the end of the day, the alternative would be imprisonment.

THE IRISH HOSPITALS

(FROM OUR DUBLIN CORRESPONDENT)

AFTER the passing of the Public Hospitals Act, 1933, the Minister for Local Government and Public Health appointed a commission, under the chairmanship of Mr. Michael W. Doran, to investigate the hospital and nursing facilities existing in the Irish Free State, to advise him as to the improvement of such facilities, and generally on any matter relating to the administration of the Hospitals Trust Fund. The first general report of the commission was issued last Saturday, and is attracting much attention both from the public and the medical profession. The commission has shown industry, insight, and vision in its work, and has made a thorough and discriminating investigation of the whole hospital problem. The acceptance or rejection of the recommendations in the report is a matter for the Minister, but the report will always be of value as a historical document, both for its survey of the present position and its suggestions for the future. It is a closely printed volume of over 200 pages and only a brief abstract can be given here.

HOSPITALS IN THE FUTURE

The hospital system which the commission visualises for the future would consist of district hospitals, county hospitals, and regional hospitals. The district hospitals, of which there might be several in a county, would deal with such acute medical cases and receive maternity and surgical cases as could properly be treated without special services of any kind. The county hospitals—one in each county remote from a regional hospital—would cater for acute medical and surgical cases. Regional hospitals would be at the teaching centres of Dublin, Cork, and Galway, and also at Limerick and possibly at Sligo. They would deal with acute or obscure medical and surgical cases.

CONDITIONS IN DUBLIN

A careful survey is given of the existing facilities in the several centres, and a discussion follows of the improvements and additions considered desirable. The problem of Dublin is of most interest. In the opinion of the commission the number of general hospitals in Dublin is too large, and many of the hospitals are too small, the number of beds ranging from 40 to 399, excluding the poor-law hospital which has 1582 beds. The commission recommends that the ten clinical hospitals should be reduced to seven by the amalgamation of four hospitals on the south side of the city—the Meath, Mercer's, Sir Patrick Dun's, and the Royal City of Dublin. Of these four the three last mentioned have put forward a scheme of amalgamation, and in regard to the Meath, the commission does not think that its obligations are sufficient to exclude it from the scheme, and advises against any large expenditure on it should it remain independent. St. Vincent's Hospital has considered removal from its present site in St. Stephen's Green to a site on the outskirts of the city, and should be considerably enlarged. The commission is not concerned with the Adelaide Hospital which has not applied for any grant from the Hospitals Trust Fund. The commission does not recommend any interference with Dr. Steevens' Hospital, the only remaining hospital on the south side of the city, its location and the nature of its activities rendering its inclusion in a scheme of amalgamation inadvisable. On the north side of the

city the Richmond Hospital and the Mater Misericordiae Hospital should both be considerably enlarged. The Charitable Infirmary (Jervis-street Hospital) should remain to carry on its work as at present, being in fact the principal accident hospital of the city. To sum up, the scheme provides for four hospitals of 550 beds each, two on the north side and two on the south, together with Dr. Steevens' and Jervis-street, and presumably the Adelaide, as at present. It is further recommended that these voluntary hospitals should take over the care of such acute cases as are at present given care in the poor-law hospital.

FEVER HOSPITALS—ACCOMMODATION FOR TUBERCULOUS CASES

The commission proposes the abolition of the fever wings attached to certain of the voluntary hospitals and the abandonment of the present fever hospital in Cork-street in favour of a new fever hospital to be built in or near Dublin. This proposal has already been approved by the Minister who has introduced a Bill to the Dáil to give it effect. It is not intended to amalgamate the three maternity hospitals of Dublin. One of them, the National Maternity Hospital, has just completed a new and greatly enlarged building. Enlargement of the Rotunda is recommended, and the abandonment of the present building of the Coombe with its removal and rebuilding on the site now occupied by Cork-street Hospital.

With regard to hospital accommodation for tuberculosis, the commission declares that there is a definite shortage of bed accommodation in the country, both for pulmonary and for non-pulmonary cases. The report recommends an open-air unit of 100 beds at Our Lady of Lourdes Hospital, County Dublin, and open-air hospitals of 50 beds each at Cork and Galway; and also a special tuberculosis hospital in Dublin. There is need for further special provision for dealing with cancer, but the commission is not yet in a position to make a recommendation.

PROPOSED GRANT FOR MEDICAL RESEARCH

The commission advises that a provisional grant of £10,000 a year should be given to a Medical Research Council, at present being constituted, for the purpose of medical research. The need for developing the social service side of hospital work is strongly stressed, and attention is drawn to the need for almoners' departments in nearly all the Dublin hospitals.

The commission makes a clear statement of the present financial position of the Hospitals Trust Fund and of the cost of carrying out the recommendations now put forward and meeting commitments already entered into. Considering estimates for proposed expenditure and endowment a sum of £7,900,000 will be required to enable the recommendations in regard to voluntary hospitals to be realised. Of this £3,383,853 is at present available. Recent sweepstakes have shown that the share of the voluntary hospitals from each sweepstake averages some £363,000. It is impossible to prophesy whether this return will be maintained or not, but even if it should be, it is clear that it will be some four years before the necessary fund is accumulated. The commission, therefore, believes that caution should be exercised in regard to beginning building schemes which would require a large capital for their completion until it is reasonably sure that sufficient funds will be available. With care, however, an advance might be steadily made without discrimination against any particular hospital or undertaking.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

THE CORPUS LUTEUM AND PREGNANCY

Dr. J. M. Robson spoke to the Edinburgh Pathological Club last week on his investigations into the activity of the corpus luteum in pregnancy. Among animals, he said, three types can be recognised: (1) those in which ovulation occurs only after mating; (2) those in which ovulation occurs without mating but in which a physiologically active corpus luteum is not formed unless mating takes place; and (3) those in which ovulation and the formation of an active corpus luteum occur spontaneously. In some species (e.g., man) the duration of activity of the corpus luteum of pseudopregnancy is much shorter than that of pregnancy, whereas in others (e.g., dog) the periods are of roughly equal length. In some animals (e.g., the mare) the corpus luteum degenerates in the early stages of pregnancy, and this raises the question how far it is necessary that luteal secretion should continue until term. The available data show that in some species the corpus luteum is essential during almost the whole of pregnancy, but in others (man, horse, cat, and guinea-pig) its removal does not necessarily lead to abortion. The luteal hormone in Dr. Robson's opinion is probably secreted by the placenta as well as the corpus luteum, and the importance of the latter in different species during pregnancy may vary inversely with the capacity of the placenta to produce progesterin. During pregnancy this hormone is essential for the preparation of the endometrium after fertilisation, for implantation itself, and probably for the subsequent nutrition of the developing embryo and placenta. It also inhibits the reaction of the uterine muscle to oxytocin and controls the spontaneous rhythmic activity of the uterus—in these respects antagonising the action of oestrin. When the pituitary is essential to the maintenance of pregnancy, its function consists in maintaining the luteal secretion, and pregnancy can actually be maintained in the hypophysectomised rabbit by the administration of the pure hormone progesterone. Experiments now in progress, said Dr. Robson, further show that the structure and secretory activity of the corpus luteum in hypophysectomised rabbits can be maintained by injection of gonadotropic hormones. It is possible, he believes, that in species in which abortion does not follow removal of the pituitary, the secretion of progesterin by the corpus luteum and/or placenta may be under the control of gonadotropic hormones produced by the uterine contents.

MENTAL HOSPITALS AND MENTAL HEALTH

In presenting the 123rd annual report of the Royal Edinburgh Hospital for Mental and Nervous Disorders last week Prof. D. K. Henderson said he regarded institutional psychiatry as perhaps the smallest part of the psychiatrist's task. He has a much bigger sphere which involves the prevention rather than the cure of those who may be nervously or mentally ill. The importance of this principle is well recognised by the managers of the hospital whose many organisations show that they are attempting to establish a mental health service in direct relation to the community. The clinics at the Royal Infirmary, at Jordanburn Hospital, and at the University Clinic have formed a chain of medical service which offers help and treatment to all ages and for all conditions of the nervous and mental

health. The number of patients treated shows a steady increase and people are no longer unwilling to consult a psychiatrist. The clinics are of great value in allowing medical students to become familiar with every phase of nervous and mental illness. The student is taught to learn to appreciate how emotional forces can control and modify bodily functions and how readjustment can be effected. The importance of this is emphasised by the fact that a recent survey of a group of insured patients under the National Health Insurance Act showed that a third were incapacitated as a result of nervous illness of some kind. Prof. Henderson said he looked forward hopefully to the time when a department for the treatment of early forms of nervous and mental diseases would be incorporated in every progressive general hospital.

At Glasgow, in the annual report of the Royal Mental Hospital, Dr. Angus MacNiven points out that nearly 40 per cent. of the total admissions show a depressive reaction. He deplors the lack of understanding among the public of mental disorders and mental hospitals, which he describes as a serious obstacle to progress. An encouraging feature, however, is that more than half of those admitted to the hospital came as voluntary patients, using the hospital for the treatment of their mental illness as they would a general hospital for the treatment of a physical complaint. A mental hospital is not a place of discipline, but should be regarded more as a refuge to the patient in time of trial. He stressed the importance of providing facilities for the treatment of functional nervous disorders. The Lansdowne Clinic provided an initial step in this direction, but many cases required to be removed from their home environment and there is an urgent need for the provision of a special hospital or a special department in one of the general hospitals for the treatment of functional nervous disorders.

THE TRAINING OF NURSES IN SCOTLAND

The report of the Scottish Departmental Committee on the Training of Nurses contains some important suggestions for the future development of the nursing profession in Scotland. After a brief summary of the functions of the General Nursing Council for Scotland, the committee review the essential requirements for a fully trained nurse, among which requirements they place experiences in the wards of a hospital for infectious diseases. They discuss the various interests involved—the nurses themselves, the public, the hospital, the doctor, and the local health authorities—showing that no scheme for the training and provision of nurses can be regarded as satisfactory which does not give due weight to the just requirements of each. They point out defects in the present system and make pertinent proposals for remedying them. The most important of the 15 recommendations summarised at the end of the report is that for the establishment of a "Central Registry" to contain the names of nurses who are "fully trained," that is, trained for five years, four of them being spent in a medical and surgical hospital and in a fever hospital, followed by two courses of six months each out of a selection offered, such as sick children, tuberculosis, mental, orthopædics, chronic sick. Nurses who are entitled to have their names on two parts of the register, one being the general part, would also, under the scheme, be eligible for inclusion in the "Central Register." Other recommendations include provision for the examinations in anatomy and physiology, hygiene, and dietetics of the Preliminary State Examination, to be taken as a normal procedure

before trainees enter hospital; grants to hospitals providing facilities for the training of nurses for the "Central Register" and also, in lesser amount, to hospitals training in the present system; the establishment of a supplementary part of the register for tuberculosis nurses; and the revision of arrangements for application between hospitals in order to secure a greater degree of elasticity.

PARIS

(FROM OUR OWN CORRESPONDENT)

THE NEW FRENCH ACADEMY OF SURGERY

THERE is nothing in France exactly equivalent to the F.R.C.S. Eng. with its searching examinations and enviable prestige. There is no special surgical diploma or *brevet de chirurgien*. A certain cachet attaches to membership of the *Syndicat des Chirurgiens*, or to one or other of the Parisian or provincial surgical societies, or the surgeon may secure election to the Academy of Medicine or the Academy of Sciences. But now the old *Académie de Chirurgie* has been resuscitated at the Sorbonne in the presence of Mr. Lebrun, President of the Republic, and many other notables. Prof. Gosset, who as president of the executive committee has taken a leading part in this revival, traced in his speech the history of the Academy from its birth in the reign of Louis XV. Dissolved during the French Revolution it has carried on since as little more than a surgical society, its members not enjoying the title of academician. It has long been felt as a slur on surgeons that the Academy of Medicine should monopolise academic honours in the profession; out of a total membership of 120, only 16 seats are reserved for surgeons, though it should be noted that the present occupant of the presidential chair is the well-known surgeon, Prof. Hartmann. It would have been a delicate task to reorganise the Academy of Medicine in such a way as to satisfy the legitimate claims of the surgeons, and Prof. Gosset is to be congratulated on his solution of the problem.

NEW IDENTITY CARDS

Steps have been taken to facilitate travel in France by the issue of a special identity card to be called the "tourist card," and to be valid for six months. It will be issued gratis by French consulates, and will help to do away with some of the formality which has hitherto embarrassed the foreigner wishing to pay something more than a flying visit. The period of grace, during which identity cards were superfluous, has till now lasted only two months and a week. After this interval, visitors had to apply to the préfet for a non-worker's card, for which there was something to pay. Under the new regulations the foreigner shows his passport, signs a declaration to the effect that he will not work in France, and that he has sufficient funds to support him during his stay. His tourist card he must give up on leaving France within six months; if he stays more than that he must apply and pay for a non-worker's card. Between now and the end of this year tourists who have not received a tourist card before entering France must apply for it within 15 days of entering French territory at the local prefecture of police.

PARIS TRAFFIC

In 1935 there were 237 traffic deaths in Paris itself and 226 in its suburbs. This total of 463

compares favourably with the corresponding figure (498) for the previous year. The victims per cent. were pedestrians 56, cyclists 20, employers of various other vehicles 23. Responsibility for the accidents was divided fairly equally between the killers and the killed, 52 against 46 per cent.; in only 2 per cent. was there uncertainty which of the parties was to blame. The danger was greatest late in the afternoon, as many as 141 of all the fatal accidents occurring between 5 and 8 P.M. There were only 30 fatal accidents between midnight and 6 A.M. In 19 per cent. the accidents were traced to drivers who were "insufficient masters of their speed."

CHARLES NICOLLE

The death of Charles Richet, man of science and man of letters, has now been followed, after only a

few weeks, at Tunis, by that of another Frenchman distinguished in the world of letters as well as in that of science. Charles Nicolle was gifted with a restlessly imaginative mind, and there was nothing he hated more than the humdrum orthodoxy of most so-called seats of learning. It was, therefore, perhaps well for him that he was able to spend most of his life after 1903 in Tunis where, far from faculties and universities and learned societies, he was free to scoff at them gently and to go his own way, in science as well as in letters. He was never attached to the Pasteur Institute of Paris, and the rumour that he would succeed Roux at this seat of learning proved to be ill-founded. As he remarked whimsically a few years ago, he had too much imagination and independence ever to become a conventional man of science.

CORRESPONDENCE

INTRANASAL SUBMUCOUS INJECTIONS OF CALCIUM

To the Editor of THE LANCET

SIR,—During experiments on the local effect of subcutaneous injection of salt solutions I observed¹ that repeated injection led to thickening of the subcutaneous tissue together with desquamation of the epidermis. The thickening is probably due to an increase of fibrous tissue (histological examinations have not yet been made), and I thought that, if the same effect could be produced by submucous injections, it might be of therapeutic value in cases where excessive serous secretion shows abnormal permeability of the vessels (e.g., vasomotor rhinitis and hay-fever). This idea gained support from a case in which I had made several submucous injections with novocain for the treatment of aural tinnitus²; there appeared such thickening of the submucous tissue and disappearance of the cavernous plexus of the inferior concha that further injections were impossible.

Since then, to patients with increased serous nasal secretion, I have given submucous injections of calcium salts into the inferior concha, hoping that the constricting effect of the calcium ions would considerably amplify the non-specific effect of the salt. At first I injected 5–10 c.cm. of 1.5 per cent. calcium chloride solution; later I used stronger solutions, but as calcium chloride in high concentration injures the tissues, I employed 10 or 20 per cent. Calcium Sandoz (gluconate) solution, which was always well tolerated. The injection is made with a straight needle, at least 5 cm. long, into the anterior part of the inferior concha. Very little pain is felt, and anaesthesia is therefore unnecessary. The needle is pushed in for 1.0–1.5 cm., parallel with the concha, and 5 c.cm. is injected, taking about thirty seconds. Only a slight swelling of the concha ensues, since the injection is mostly intravenous; indeed, this submucous route may be used instead of the ordinary intravenous one when the latter presents difficulty. During the injection there is a feeling of heat in the whole body, but no other side-effects and no pain, either at the time or later. When the needle has been pulled out, an adrenaline tampon is placed in the nose and pressed against the wound; after some minutes this can be removed. I repeat the injection on the third day and again on four or five occasions. Usually I do not inject both sides on the same day. In most cases the first injection is followed

by reaction with increased secretion, but after the later injections this was not observed. In the patients thus treated the secretion has diminished considerably, and in some cases I have a very good therapeutic result with complete disappearance of unpleasant hypersecretion. In those with allergic rhinitis (principally rhinitis aestivalis) the local application of calcium is active not only in its constricting effect, but probably also because, at high local concentrations of calcium, the antigen-antibody reaction passes off without irritation of cells—that is to say, without hypersecretion. This has lately been shown by P. Kallós and L. Kallós-Defner³ in my laboratory.

A detailed report will be published later. Here I want only to show this new possibility of effective therapy.—I am, Sir, yours faithfully,

ROBERT BÁRÁNY.

Ear, Nose, and Throat Clinic, University of
Upsala, Sweden, Feb. 29th.

"A DOUBTFUL CASE OF TYPHUS FEVER"

To the Editor of THE LANCET

SIR,—It seems to me that the best comment on the epithet "doubtful" as applied to the case of typhus fever reported on p. 864 of your issue of Oct. 12th last is to be found in the following extracts taken from the article on typhus fever by Drs. Brill and Baehr in vol. i. of Nelson's "Loose-Leaf Living Medicine":—

(P. 200): "The difficulty in diagnosis is increased, when a sporadic case of the endemic variety is encountered. However if one bears in mind the important clinical features of the disease . . . mistakes in diagnosis will rarely be made. If an incorrect diagnosis is made, it may easily be corrected when the critical fall in temperature occurs, as the crisis is one of the most important differential features of the disease."

"Weil-Felix reaction . . . A negative test cannot be accepted as evidence that the disease is not typhus fever."

(P. 201): "The authors' experience is that in cases of the endemic type the serum seldom gives a W.-F. reaction in dilutions sufficiently high to be of diagnostic value."

" . . . The Widal agglutination test with typhoid bacilli was found to be of little differential value. Typhus patients who had previously had typhoid fever . . . often developed a positive Widal reaction during the second week of their disease."

To my mind the case reported is a typical instance of the sporadic endemic typhus, which is a severe

¹ Deut. med. Woch., 1932, lxxviii., 1560.

² Bárány, R.: Acta oto-laryng., 1935, xxiii., 201.

³ Klin. Woch., 1935, xiv., 1247. For further information, cf. Wojatschek, W., Undrits, V. F., and Drennowa, K. A.: Zeits. f. Hals-, Nasen-, u. Ohren-, 1933, xxxiii., 191; and Drennowa, K. A.: Arch. f. Ohren-, Nasen-, u. Kehlkopf., 1930, cxxx., 235.

but seldom fatal illness. As Dr. Brill says in the article above quoted (p. 201) referring to the tradition in text-books which inclines the student to believe that there is any difficulty in separating the two diseases (typhus and enteric): "the two diseases have nothing in common in pathology, etiology or symptomatology."

Incidentally, were the two laboratories to which the blood-serum was sent stocked with the varieties of *Bacillus proteus* isolated by the Federated Malay States Institute for Medical Research (see their Bulletin No. 1 of 1930)? It is difficult to say what value can be placed on their reports "Weil-Felix reaction, negative" on a patient who brought the disease from the Straits, if they do not report that the serum was tested against strains of *B. proteus* appropriate to the case in question. If the Port of London health authority reports typhus only when confirmatory evidence is supplied by a laboratory we should hear more about this, and in a disease like typhus it is no use hedging and saying that "bacteriologically the case was considered to be typhoid"!

I am, Sir, yours faithfully,

Hankow, Jan. 27th

A. H. SKINNER.

THE TREATMENT OF VAGINAL DISCHARGE

To the Editor of THE LANCET

SIR,—I read Mr. Gordon Luker's letter in your last issue with great interest, inasmuch as his experiences differ so widely from my own. After eight years' work in a large clinic, I have come to the conclusion that the majority of non-venereal discharges of which women complain is due either to a staphylococcal or, more frequently, to a trichomonas infection of the vagina. In a small series of 30 cases which I investigated some time ago, I found the trichomonas—identified by the dark-ground method—in 14, or nearly 50 per cent. Its presence was in 9 cases diagnosed before microscopy by the typical frothy discharge. This afternoon I examined the first 6 cases that came in, and found trichomonas in 2 of them. Advertisement or no, this form of infection has yielded more rapidly to Devegan than to any previous form of treatment that I have tried, and while not for an instant suggesting the application of the remedy to vaginal discharges in general, I have found it very useful for what, in my experience, is a common infection.

I am in complete agreement with Mr. Luker on the necessity for a thorough examination of the patient and the discharge itself, but I must differ from him in his opinion of the relative frequency of a trichomonas infection, and the efficacy of devegan in its treatment. I am, Sir, yours faithfully,

Harley-street, W., March 2nd.

KEITH DUFF.

"NEAR" X RAY THERAPY

To the Editor of THE LANCET

SIR,—Consideration of the possibilities of Chaoul's new "near" X ray therapy method (THE LANCET, Feb. 29th, p. 482) suggests that these are not limited to the special low-voltage short-focus tube, but could be extended to a much wider use with any fully shock-proof X ray therapy tube. Indeed, many of Chaoul's best results have been attained with a kilovoltage of 180, with 0.5 mm. Cu. filter at 8 cm. distance, or with 100 kV., 0.5 mm. Cu., 11 cm. distance (see Tables C and B in *Strahlentherapie* 1933, xlviii., 31 (21 cases)). Tests with a 200 kV. shock-proof tube have shown that it gives a radiation of 50 r/min. at 100 kV. and 30 cm. distance, 0.2 mm. Cu. equivalent filter. Approximately at 15 cm. the radiation is

200 r/min., and at 7.5 cm. it is 800 r/min. Treatment at 6 cm. seems possible with this tube. I doubt if such extremely high intensities as 800 r/min. or more have ever been applied to patients: they would correspond to that from one curie in a bead-sized light applicator to rodent ulcers of minute size by Kelly and Burnham for one minute at the end of a long rod.

After tests of the tube's emission at from 1 to 6 M.A. from 60 to 100 kV. (0.2 mm. Cu. filter) and from 1 to 4 M.A. from 100 to 200 kV. (with heavier filters) I have treated several patients with ulcerated breasts (primary or recurrent) and a supraclavicular metastasis from a parotid tumour. The factors used were 12 and 15 cm. distance, 70 or 80 kV., 4 M.A., and 0.2 mm. Cu. filter; 1½ and 2 minutes exposure. Tests with surgical specula for mouth, tonsil, and cervical applications have also been made with ionisation and pastille methods. Lead or lead-rubber to localise the fields has appeared adequate; special applicators could be put on the market for various sizes and distances.

The daily treatments of from one to four minutes contrast agreeably with the opposite pole of method, the protracted-fractional of Coutard. The latter appears to act "selectively," powerfully affecting abnormal and sparing normal tissues (as radium distance applications do) and is thus most valuable for deep-lying tumours in vital areas; whereas the near method appears to act more "cytocaustically"—as near or contact radium applications (gamma or beta) act—thus being more suitable for quite superficial lesions, specially if already ulcerated. These two extremes of method have greatly enlarged the field of X ray therapy. The near method, however, should be explored to the full possibilities of shock-proof tubes and not be limited to the use of the small aperture 60 kV. tube specially designed for cavity applications.—I am, Sir, yours faithfully,

J. H. DOUGLAS WEBSTER.

Harley-street, W., Feb. 29th.

ALLEGED NEGLIGENCE IN HYPODERMIC INJECTION

To the Editor of THE LANCET

SIR,—The article in last week's issue of THE LANCET (Medicine and the Law, p. 500) reminds me of an unpleasant experience I suffered about 25 years ago. I have before now related the circumstance to my students as a warning.

About five years prior to the incident leading to the allegation I had been consulted by a practitioner of medicine who had contracted syphilis, and I had treated him over a long period. One evening a telephone message summoned me to his house some four miles distant. He was suffering intense pain. Obviously morphine was necessary, but upon my suggestion that I should go home and fetch a syringe and drug he replied, "It will take you half an hour" (20 mile limit then). "I can't stand this pain. Here is my syringe and morphine."

Upon examination of the syringe I noticed that it was fitted with a leather washer and remarked that it could not be boiled. He persuaded me to use it; after rinsing it many times in carbolic acid solution, morphine was dissolved in boiled water and injected into the arm. Three or four days later I heard that the doctor was in a home, and on going to see him learnt that he had cellulitis of the arm which needed incisions. I expressed regret. The following day a letter informed me that he was taking proceedings against me, claiming damages for negligence. On

approaching the defence society to which I subscribed I learnt that the plaintiff had already communicated with the society, and the secretary doubted whether in the circumstances the committee of the society would arrange for my defence, because I should lose. In answer to the question "Why," he said that in cross-examination the counsel would ask me whether I had found fault with the syringe, and upon my admitting that I had he would say, then you had no right to use it. A mutual friend approached the practitioner. Years later it came to my ears that he had used the argument that the counsel for the defence would have asserted that in a normal man cellulitis would have not developed, and that the plaintiff's resistance had been reduced by syphilis. Anyway the charge was withdrawn; a few days later a generous patient made me a present which I had the pleasure of forwarding to the unfortunate practitioner, and this more than covered his expenses.

I am, Sir, yours faithfully,

O. L.

March 2nd.

STAMMERING

To the Editor of THE LANCET

SIR,—I was very interested in the annotation on the subject of stammering in your issue of Jan. 25th (p. 208) but I was puzzled by the following sentence: "For this reason some authorities have dispensed with any specific speech training and have concentrated . . . on relaxation." Since we are not bivocal but use the larynx for speech and song, surely speech training should proceed on the lines of training the voice for song. All singers will agree that one of the most important factors in voice training is to teach the pupil to relax as far as possible all muscles in the throat and neck which do not assist in the production of vocal tone; in other words, to overcome hypertonicity which must be overcome not only by a stammerer but by every speaker or singer who aims at getting the best results from his larynx.

Miss Kate Emil-Behnke in her interesting letter of Feb. 22nd seems to contradict herself when she says, "it will yield to psychic handling combined with 'relaxing' and quiet breathing exercises," and "the serious error of adopting *elocutionary* treatment." If elocution means, as it should, speech training and voice training, it must include some study of deep breathing (to learn breath control) and "relaxing" as described above. If Miss Behnke means the type of elocution which merely consists in the overstressing of the consonants I am in agreement with her, because nearly all stammerers already overstress the consonants at the expense of the vowels, and thus talk in the jerky, staccato manner which, in its most exaggerated form, is a typical stammer. When singing the vowels must predominate, and they should do so to some extent in good speech. It is this predominance of the vowels which enables the stammerer to sing without difficulty. If the stammerer will cultivate a slight predominance of vowels over consonants he will learn to speak smoothly and will overcome hypertonicity. This should be the aim of everyone who wishes to speak musically and audibly; it is not a mannerism to cure a stammer but the method of getting the best results with the least effort.

Although some knowledge of deep breathing and breath control is needed for perfect speech it should be clearly understood that taking a deep breath before speaking will increase the difficulties of a stammerer and of any other speaker. "Little and often" is a good rule. One of the greatest singers

of all time said, "Never take more breath than can be easily controlled."

The unusual type of stammerer who stammers on the vowels as well as "sticking" on the consonants presents a difficult problem to the speech therapist, but space will not allow a detailed explanation here.

The variability of the incidence of a stammer proves that it is very largely due to a neuropathic condition, but I cannot think of anything more calculated to overcome this condition than learning the fundamental principles of perfect speech, while the success which follows such study will obviously allay anxiety.

I am, Sir, yours faithfully,

H. ST. JOHN RUMSEY, M.A.,

Instructor for Speech Defects at Guy's Hospital.

Feb. 22nd.

A SECONDARY REACTION AFTER ANTI-CHOLERA INOCULATION

To the Editor of THE LANCET

SIR,—During the last cholera epidemic in the Bassi district in Patiala State mass anticholera prophylactic inoculation was done. This produced a general and a local reaction which lasted for two or three days after the inoculations. To my utter surprise, however, about 8–10 per cent. of the persons inoculated got another general and local reaction on the twelfth, thirteenth, or fourteenth day after the inoculation, in the usual form of a pyrexia (varying from 100–102° F.) and local redness at the site of the injection, along with pain and tenderness. But this secondary reaction, as I may call it, was milder than the primary one, and no other sign or symptoms were observed. It lasted for about 28–36 hours only, and many of the sturdy villagers took no account of it. Those who came to us for advice were treated on general lines and symptomatically.

The only explanation that I could think of at that time was that the condition was caused by abscess formation due to negligence in our asepsis. But among 4000 cases of inoculation done by me in that part of the district, there was only one abscess (on the sixth day). We had taken every possible aseptic precaution throughout and the vaccine, which was supplied by the Central Research Institute, Kasauli, was used within two or three days of its receipt. I consulted my colleagues who too were working in the other cholera-stricken areas of the State and all of them had also observed the same phenomenon. We could find no published information, however, concerning the cause or significance of a secondary reaction after prophylactic anti-cholera inoculation, and I should be glad therefore if any of your readers could tell me whether they have seen such a thing or can throw light on its origin.

I am, Sir, yours faithfully,

M. TEWARI,

Hon. Clinical Assistant, Rajindra Hospital,
Patiala (State), India.

Jan. 15th.

AN ADDRESS IN HARLEY STREET

To the Editor of THE LANCET

SIR,—A distinguished hospital surgeon, not living in Harley Street, told me the following story; it is very apropos to Mr. F. C. Goodall's letter in your columns last week. The surgeon was asked to see in consultation a patient living in the country, when it was his duty to tell the husband "there is nothing to be done." Leaving the house with the family practitioner, the latter was called back by the husband, and on rejoining the consultant he exclaimed,

Surgery Inspection

A practitioner who recently applied for inclusion in the London medical list intimated that he desired to carry on an insurance medical practice at a place other than where he resided, the distance between the addresses being about a quarter of a mile. There was no caretaker at the surgery, no deputy had been appointed to act in case of emergency, and there was no telephone either at the residence or at the surgery. The doctor said he proposed to exhibit at the surgery a notice indicating his private address. The insurance committee, not being satisfied that the proposed arrangements were adequate, asked an ex-chairman of the committee, along with the secretary of the local medical and panel committee, to visit the surgery and report. On the morning on which the visit was due to be made a letter was received from the doctor to the effect that his surgery premises were shortly to be demolished, that he was hoping to obtain other premises in the course of a few weeks, and suggesting that in these circumstances the visit was unnecessary. It was then too late to cancel the visit and the report showed that the waiting- and consulting-room consisted of a small shop with a screen running partially down the centre. The

screen did not reach from end to end of the room nor did it reach the ceiling, there being at least three feet between the end of the screen and the further wall and a similar gap between the top of the screen and the ceiling, so that a waiting patient could hear all that occurred in the consulting-room. The committee's representatives informed the doctor that the accommodation provided was unsuitable for an insurance medical practice; his application for the inclusion of his name in the medical list remains in abeyance pending the submission of particulars about alternative accommodation. Some other premises have recently been found unsuitable for their purpose. Up to the present time visits have been paid to surgeries only when practitioners have applied for consent to the employment of an assistant or where some special cause has arisen. The insurance committee has now referred it to the proper subcommittees to consider and report on the desirability of satisfying the committee in every instance with the surgery accommodation to be provided by an insurance practitioner before he undertakes insurance work. Clause 9 (4) of the Terms of Service lays on the insurance committee the onus of seeing that the accommodation provided befits the conditions of practice.

OBITUARY

JAMES BRUNTON BLAIKIE, M.B. Edin. [R]

Dr. James Blaikie, who died on Feb. 26th, received his medical education at the University of Edinburgh where he was a successful student and president of the Royal Medical Society. He graduated as M.B., C.M. in 1896 and proceeded to the M.D. degree in 1903, and acted as resident physician at the Royal Infirmary. In London he held clinical appointments at the Hospital for Sick Children, the Victoria Hospital for Children, and the Hospital for Skin Diseases, Blackfriars. He was appointed physician to the Hospital for Consumption in Margaret-street, and was assiduous in attendance there, his professional work being of a practical order. He made occasional contributions to the *Edinburgh Medical Journal* and to these columns, but his time was absorbed in an extensive practice. He was held in high esteem by his colleagues and a large section of the public, as was evidenced by the attendance at the service held in his memory. He had the gift of making friends of his patients, and in particular earned the gratitude of the mothers whose children he had under his care. Such holidays as he spared himself were spent in fishing, a sport to which he was devoted and about which he wrote pleasantly.

SEPTIMUS TRISTRAM PRUEN, M.D. Durh.

THE death occurred on Feb. 19th of Dr. Septimus Pruen, for many years a prominent practitioner in Cheltenham. He was born at Clifton, Bristol, in 1859, the son of Dr. William Ashmead Pruen, received his education at Bedford School, proceeding for medical training to St. Bartholomew's Hospital and the University of Durham. He graduated as M.B. Durh. in 1883 with honours and was a medallist for his public health work; in the following year he took the diploma of M.R.C.S. Eng. He was appointed assistant demonstrator in anatomy and physiology at Durham and later acted as house surgeon to the Cheltenham Hospital. This post he held for two years and in 1886 proceeded to Central Africa as a medical

officer of the Church Missionary Society. He remained in Africa for three years and recorded his experiences in a short work "Arab and the African." On his return to England he commenced practice in Cheltenham and became medical officer at the Cheltenham Medical Workhouse and Provident Dispensary, and surgeon to the Hospital for Sick Children. About this time the open-air treatment of phthisis was being introduced into this country by Otto Walther's pupils and Dr. Pruen collaborated with his partner, Dr. J. C. Braine-Hartnell in founding the Cotswold Sanatorium on the hill 600 feet above the town. The venture was popular and successful, and for many years there was a considerable publication of useful papers dealing with various aspects of hygienic-dietetic treatment. Dr. Pruen was local medical officer of the Charity Organisation Society and was an energetic member of the British Medical Association of which he was a member for 44 years, being local secretary at the Cheltenham meeting in 1901 and later president of the Gloucestershire branch of the Association.

VINCENT THOMAS BORTHWICK YULE, M.B., Ch.B., D.P.H. Aberd.

THE death occurred on Feb. 17th of Dr. Vincent Yule, the M.O.H. for the borough of Peterhead. He was born in Peterhead and had a successful career at the University of Aberdeen, where he graduated as M.A. and took the medical degrees of M.B., Ch.B. in 1917 and D.P.H. in 1920. During the war he received a commission as Captain R.A.M.C., and saw service in East Africa. At the conclusion of hostilities he was appointed R.M.O. at the Aberdeen City Hospital, after which he accepted an appointment in Mexico as medical officer to one of the oilfields. On his return he was for three years in practice at Maud, Aberdeenshire, when he entered on practice at Peterhead and in 1925 was appointed M.O.H. for the borough, a position which he held at the time of his death. This occurred at the age of 45 after a short life of full and varied experience.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Milk and Nutrition Problem

ON March 2nd in the House of Commons Mr. RAMSBOTHAM, Parliamentary Secretary to the Ministry of Agriculture, moved the third reading of the Milk (Extension of Temporary Provisions) Bill.

Mr. T. JOHNSTON, in moving the rejection of the Bill, said that since the previous discussions on the measure in the House of Commons there had been a remarkable correspondence in the *Times* on the subject of insufficient nutrition among the population of this country. Nobody in that correspondence denied that at least 10 per cent. of the population was living below the British Medical Association's minimum standard. Sir John Orr had said that almost one-half of the population in our industrial areas were not getting enough to eat, and he mentioned milk as one of the foodstuffs which ought to be better and more widely distributed. The Minister of Agriculture did not deny that a large proportion of the population was under-nourished, and yet the right hon. gentleman was using public money for the destruction of 27 per cent. of liquid milk through its diversion to manufacturing purposes. We were spending at least £111,000,000 a year in the treatment of disease and the policy of organising scarcity in such an essential foodstuff as liquid milk was against the public interest.

Mr. ELLIOT, Minister of Agriculture, in reply, said that the enormous importance of fresh food such as milk in the avoidance of disease was a matter of general agreement in the House. His only point of difference with Mr. Johnston was when the right hon. gentleman said that the Government were organising scarcity. The production and consumption of milk had increased greatly in recent years. Mr. Johnston's motion, if carried, would bring the milk in schools scheme to an end. Steps were outlined in this Bill to extend the supply of milk itself, as well as that of butter and cheese.

Mr. JOHNSTON asked whether raising the price of milk to children's hospitals and to poor-law infirmaries was doing anything to increase consumption.

Mr. ELLIOT called on Mr. Johnston to mention one child in one hospital who had received a pint of milk less because of the steps taken by the Milk Marketing Board.

Mr. JOHNSTON asked whether the Minister of Agriculture was aware that a hospital in Glasgow had to pay £500 a year more for its milk, and that there were threats by the managers of some hospitals that they would be compelled to take a lower grade of milk.

Mr. ELLIOT: I challenged the right hon. gentleman to name one hospital where one child was having one pint of milk less per day and he is totally unable to do so. He merely said that in future in some hospital a lower grade of milk may be used. I do not think he has met the challenge. If the whole assistance being devoted to the butter and cheese industry were devoted to the liquid milk industry it would not mean a reduction of more than a quarter of one farthing a pint in the price of liquid milk, and no one would say that this would increase the consumption of liquid milk to-day. The right hon. gentleman went on to say that the Government had given a breathing space to the industry for which they made no apology, and they had given cheap milk to schools, for which they did not apologise, and this was a Bill to continue those things.

Mr. T. WILLIAMS said that nothing in this Bill was calculated to provide more milk for that section of the community which most needed it.

The motion for rejection was negatived by 242 votes to 110, and the Bill was read the third time.

Voluntary Hospitals (Paying Patients) Bill

In the House of Commons on Thursday, Feb. 27th, the Voluntary Hospitals (Paying Patients) Bill was read a second time.

HOUSE OF COMMONS

WEDNESDAY, FEB. 26TH

Newspaper Wrappers and Food Contamination

Mr. H. G. WILLIAMS asked the Minister of Health if he was aware of the practice among retail butchers and fishmongers of purchasing old newspapers, which might be contaminated and carriers of disease, for the purpose of wrapping up meat or fish sold in retail shops; and whether he would take steps to make this practice illegal, and ensure the use of clean grease-proof paper for these purposes.—Mr. SHAKESPEARE replied: My right hon. friend is aware of this practice, which on general grounds of cleanliness is to be deprecated, but he is advised that there is no definite evidence that the wrapping of meat or fish in newspapers is a factor in the spread of disease, and he would not therefore be justified in taking the steps suggested by my hon. friend.

Medical Services at Junior Instruction Centres

Mr. TEMPLE MORRIS asked the Minister of Labour whether medical inspection and treatment was now available for boys and young men attending instructional centres in the special areas; and, in that case, by whom the cost was provided.—Mr. ERNEST BROWN replied: I assume that my hon. friend is referring to persons in attendance at junior instruction centres and not to adults. Proposals submitted by education authorities for the establishment and conduct of authorised courses of instruction, including junior instruction centres, may include provisions under which any boy or girl may be referred by the superintendent of the course to the school medical officer, with a view to such inspection, and, in England and Wales, such treatment as may be found desirable. I have approved proposals including provisions—of varying extent—for medical services from the following authorities in the special areas: education authorities for the administrative counties of Durham, Northumberland, Glamorgan, Monmouth, Ayrshire, Dunbarton, and from the education authorities for the county boroughs of Gateshead, South Shields, Sunderland, and Merthyr Tydfil. I intend, at an early date, to issue to all authorities conducting authorised courses of instruction a memorandum dealing with the provision of medical services in connexion with junior instruction centres, and it is my hope that this will lead to a marked increase in the number and scope of proposals of this kind.

THURSDAY, FEB. 27TH

Provision of Food at Junior Instruction Centres

Mr. GEORGE HALL asked the Minister of Labour whether he was aware that an examination by the school medical officers revealed that 57 per cent. of the trainees at four junior instruction centres in the county of Glamorgan were suffering from malnutrition; and whether he would take steps to empower the local authorities responsible for these centres to supply meals as well as milk to trainees in attendance.—Mr. ERNEST BROWN replied: Local education authorities have no power to provide ordinary meals in junior instruction centres. Free milk is, however, being provided in the Glamorgan centres, and I am informed that the school medical officer expressed the view that since any food given at the junior instruction centres can only be a casual and temporary addition to the diet of the pupils, the milk available is more useful than any other food which could be suggested in the circumstances. I am, however, making inquiries into the adequacy of the existing arrangements.

Certification of Cases of Silicosis

Mr. LEACH asked the Home Secretary if he would consider introducing further legislation to ensure prompter

and easier certification of cases of silicosis in the mining and quarrying industry, and to ensure that compensation and measures for the recovery of the victims might be made more certain.—Sir JOHN SIMON replied: I would refer the hon. Member to the reply given on the 13th of this month. If the hon. Member will be good enough to send me a statement showing where and how it is suggested that the medical arrangements and the procedure under the Silicosis Schemes could be improved, I shall be happy to consider it.

Mr. LEACH: Does not the right hon. gentleman agree that both the law and the regulations operate very harshly towards these poor fellows?—Sir J. SIMON: It is a very complicated subject, but I have the fullest sympathy with those who want to have the whole situation cleared up and made as simple as possible.

Death Certifications and Vaccination

Mr. BANFIELD asked the Minister of Health how many of the deaths associated with vaccination on certificates of deaths in the years 1933, 1934, and 1935, respectively, were or would be classified by the Registrar-General to vaccinia; and how many deaths under five and over five years of age, respectively, were or would be classified as chicken-pox and erysipelas during the years in question.—Sir KINGSLEY WOOD replied: The following is the statement:—

Year.	Deaths associated with vaccination and classified to vaccinia.	Deaths classified to—			
		Chicken-pox.		Erysipelas.	
		Under 5 years.	Over 5 years.	Under 5 years.	Over 5 years.
1933	3	31	12	296	895
1934	5	36	10	231	1227
1935	4	Not yet available.			

Public Health Legislation

Sir ARNOLD WILSON asked the Minister of Health whether and, if so, when he proposed to introduce a Public Health Amendment Bill which would embody in that general law and make generally applicable powers usually granted by Parliament as a matter of course in local Acts, as recommended by the Select Committee on Private Bills in 1930 for reference to a joint committee of both Houses, in the same way as Consolidation Bills.—Sir KINGSLEY WOOD replied: My hon. friend will be aware that a draft has been published of a Bill to consolidate with amendments part of the general public health law. In preparing this Bill account has been taken of the relevant provisions allowed by Parliament in local legislation. I regret that considerations of parliamentary time have rendered it impracticable fully to implement the recommendation to which my hon. friend refers, but I recognise its importance and hope it may be practicable to take further action in an early session.

Unemployed Persons and Food-supplies

Mr. DAVID ADAMS asked the Minister of Health whether, in view of the fact that the consumption by families of the unemployed of meat, including beef, mutton, bacon, &c., and of eggs, was, like that of milk, only about one-third that of the average of the whole country, he would take the necessary steps, as in the case of milk, to ensure cheaper supplies to unemployed of these essential food-stuffs, and thus raise the low nutritional standards of these citizens.—Sir KINGSLEY WOOD replied: The consumption of the commodities mentioned as well as of other foodstuffs by various classes of the community is a matter which receives the constant attention of my Advisory Committee on Nutrition, but the most effective steps that can be taken to raise nutritional standards are undoubtedly such steps as are being taken by the Government to reduce unemployment and increase purchasing power.

Tuberculosis in Wales

Sir WILLIAM JENKINS asked the Minister of Health what number per thousand of the population of Wales

were suffering from tuberculosis; what number under treatment at sanatoria or other suitable institutions; what number of recoveries; and what number of deaths under 12 years of age, under 20 years, under 30 years and over for the years 1924, 1926, 1930, 1934, and 1935 giving the figures separately for each county in Wales.—Sir KINGSLEY WOOD replied: As regards the first three parts of the question, the following are the figures for which the hon. Member asks, according to the returns furnished by the local authorities and the King Edward VII Welsh National Memorial Association to the Welsh Board of Health in respect of the year 1934:—

Tuberculous persons on the registers of medical officers of health at Dec. 31st, 1934, per thousand of the population of Wales	9'64
Under treatment or observation at sanatoria or other suitable residential institutions on Dec. 31st, 1934 ..	1650
Number of recoveries recorded during 1934	1213

As regards the fourth part of the question, figures are not available for the age-groups specified. The available figures of tuberculosis deaths by ages in the 13 Welsh counties are published in the Registrar-General's Statistical Review, Tables, Part I., Medical, Table 20 for the years 1924, 1926, and 1930, and Table 24 for 1934. Figures for 1935 are not yet available.

MONDAY, MARCH 2ND

Expectation of Life of War Pensioners

Mr. MABANE asked the Minister of Pensions if, for the purpose of his estimates, the expectation of life of war pensioners was calculated according to a normal table or on a table which gave to war pensioners an expectation of life shorter than the normal.—Mr. R. S. HUDSON replied: The mortality-rate of disabled pensioners is and will for some years to come be greater than the normal, and in framing the Estimates of the Ministry of Pensions this and all other relevant factors are taken into account.

Convictions for Murder

Mr. DAY asked the Home Secretary the number of persons convicted of murder and sentenced to death for the five years ended to the last convenient date; the number reprieved; the number of sentences quashed on appeal; the number of persons certified as insane and removed to Broadmoor; and the number so convicted that were recommended to mercy by the jury, and with what result.—Sir JOHN SIMON replied: The particulars are as follows:—

Year.	Persons convicted of murder and sentenced to death.	Reprieved.	Sentences quashed on appeal.	Certified insane and removed to Broadmoor.	Recommended to mercy.	
					No.	Result.
1931 ..	18	7	1	1	4	All reprieved.
1932 ..	15	6	0	0	5	3 reprieved. 2 executed.
1933 ..	19	9	0	0	10	9 reprieved. 3 executed.
1934 ..	24	12	2	1	12	6 reprieved. 1 executed. 1 conviction quashed on appeal.
1935 ..	21	8	2	1	8	1 conviction quashed on appeal.
Total for five years 1931-35	97	42	5	3	39	32 reprieved. 6 executed. 1 conviction quashed on appeal.

Imported Chilled Meat and Foot-and-Mouth Disease

Brig.-General CLIFTON BROWN asked the Minister of Agriculture whether, in view of the fact that the virus of foot-and-mouth disease survived in chilled meat and that this disease was distributed by the use of bones imported in chilled meat, the Government was taking any action to prevent the importation of meat which

might carry the virus from any country in which this disease prevailed.—Mr. ELLIOT replied: So far as I am aware, there is no evidence to support my hon. friend's statement that foot and mouth disease is distributed by the use of bones imported in chilled meat, but I recognise that there is some such risk. Regulations governing the exportation of carcasses to this country have been in force in the South American meat exporting countries since 1928 and assurances were given as recently as last year by the Governments concerned that these regulations are being properly enforced. In addition, orders are in force in this country directed to preventing the spread of disease through pig food and meat wrappers and other similar material.

Small-pox Deaths

Mr. BROMFIELD asked the Minister of Health, in view of the fact that the published reports of his department did not supply full statistics as to the numbers of vaccinated and unvaccinated cases of, and deaths from, small-pox which occurred in England and Wales during the years 1922 to 1934, he would supply a statement in respect of each of the years in question, showing, so far as possible, the cases and deaths which were recorded in the hospital registers as vaccinated, unvaccinated, and doubtful, respectively.—Sir KINGSLEY WOOD replied: I regret that I have no fuller information in respect of the years 1922 to 1933 than that contained in the annual reports of the Chief Medical Officer of my department. The appended table gives the vaccinal condition of cases of small-pox occurring in England and Wales in the year 1934 in towns of 150,000 population and over.

A. = Successfully vaccinated. B. = Unvaccinated.

Ages.	Vaccinal condition at time of infection.*		Ages.	Vaccinal condition at time of infection.*	
	A.	B.		A.	B.
Under 1 year	1	14 years	..	6
1 year	15	15 "	..	26†
2 years	Nil.	20 "	..	16
3 "	..	7	25 "	..	8
4 "	..	7	30 "	..	4
5 "	..	Nil.	35 "	..	2
6 "	..	4	40 "	..	4
7 "	..	4	50 "	..	..
8 "	..	4	60 "	..	..
9 "	..	6	70 "	..	..
10 "	..	10	80 and upwards	1	..
11 "	..	2			
12 "	..	4			
13 "	..	1			
14 "	..	6	Totals ..	22	119

* There were no doubtful cases.

† Including one fatal case in a youth of 16 years.

Smokeless Fuel and Atmospheric Purity

Mr. DAVID ADAMS asked the First Commissioner of Works, in view of the recent report upon atmospheric pollution issued by the Department of Industrial and Scientific Research which showed that the general cleanliness of the atmosphere was not improving, if he would give a lead to the country by ordering the use of smokeless fuel in the Government buildings under his department in London.—Mr. ORMSBY-GORE replied: Smokeless fuel is already used in Government offices whenever local circumstances make it possible without an unreasonable increase in cost.

TUESDAY, MARCH 3RD

Mental Deficiency Research

Mrs. TATE asked the Minister of Health how many local authorities had made use of their powers under the Mental Treatment Act, 1930, to provide money for research into mental disorder and deficiency; and how much money they had provided.—Mr. SHAKESPEARE replied: Owing to financial considerations, schemes have not yet been initiated under the specific provisions referred to; but the most recent record of the varied and extensive research work proceeding in public mental hospitals and mental deficiency institutions will be found in Part II. of the Board of Control's Report for 1934.

Army Recruits and Defective Health

The Duchess of ATHOLL asked the Secretary of State for War the proportion of men applying to join the Army in the last three years who were rejected for defective health or physique.—Mr. DUFF COOPER replied: The percentage of men served with notice papers who were rejected for medical or physical reasons during the three years ending Sept. 30th, 1933-35, was 52, 46, and 33 respectively.

School Dental Service

Mr. DAY asked the President of the Board of Education the number of children attending public elementary schools in England and Wales in the 12 months ended to the last convenient date who were inspected by school dentists; the number who were found to require treatment; and the number who received treatment under the arrangements made by local education authorities.—Mr. OLIVER STANLEY replied: Complete information is not yet available for the year 1935. The figures for the year ended Dec. 31st, 1934, are as follows:—

Children inspected	3,302,838
Found to require treatment	2,273,508
Treated	1,431,775

FOTHERGILL TESTIMONIAL FUND

THE following is the third list of subscriptions to the testimonial to Dr. E. Rowland Fothergill, received in response to the letter published in the *British Medical Journal* and *The Lancet* of Jan. 18th.

Amount previously acknowledged, £386 7s.

A. M. Daldy (Hove), £1 1s.; A. C. Gemmell (Hove), C. G. Schurr (Hove), L. A. Parry (Hove), A. Hall, F. H. Lawson (Hove), R. Ashleigh Glegg (Lewes), J. G. Thwaites (Brighton), G. B. Thwaites (Brighton), E. V. Oulton (Hove), I. Turton (Hove), D. A. Crow (Hove), Lillias M. Jeffries (Hove), Barbara M. Logan (Hove), Florence M. Edmonds (Hove), M. J. Oliver (Hove), A. N. Pollock (Hove), Robert Sanderson (North Lancing), Gladys M. Wauchope (Hove), Conwy L. Morgan (Hastings), F. J. Thorne (Bexhill-on-Sea), P. Lazarus-Barlow (Bexhill-on-Sea), R. Jaques (Worthing), Dr. Martin, Dorothea A. Carew Hunt (Hove), R. C. McQueen (Eastbourne), J. M. Anderson (Hove), J. T. Calvert (Eastbourne), A. G. K. Ledger (Shoreham), M. Ross Taylor (Eastbourne), Eliot Curwen (Hove), A. Burn (Eastbourne), P. S. Eves (Brighton), Duncan D. Macintosh (Worthing), Mark Jackson (Bexhill-on-Sea), and G. Tolcher Eccles (Hove), £60; H. F. Wattford (Newcastle) and G. R. Fortune (Newcastle), each 10s. 6d.; R. Boyd (Manchester), £1 1s.; Northumberland Local Medical Committee, £26 5s.; Derby Local Medical and Panel Committee, £5; Stockport and Leicester Local Medical and Panel Committees, and Sir Robert Bolam (Newcastle), each £5 5s.; A. Gregory (Manchester), F. L. Anglor (Wigan), T. H. Gardner (London), J. N. Ferguson (York), J. W. King (Derby), E. W. Goodall (London), and F. J. Baildon (Southport), each £1 1s.; W. Johnson Smyth (Bournemouth), £3 3s.; A. B. Murray (Banff), £5 5s.; Jane L. K. Aitken (London), 10s. 6d.; G. J. Awburn (Mottram, Manchester), John Clay (Newcastle), M. W. Renton (Dartford), and C. E. Douglas (St. Andrews), each £1 1s.; Nottinghamshire Panel Committee, £10 10s.; A. R. Berrie (London) and D. Clow (Cheltenham), each £1 1s.; Huntingdonshire Panel Committee, £2 2s.; J. E. Hailstone (Slindon Common, near Arundel), R. S. Harper (Hove), A. H. Williams (Horsham), W. Broadbent (Hove), H. Herbert (Worthing), E. R. Hunt (Hove), Alice Owen (Horsham), F. H. Allfrey (Southwick), W. G. Thwaites (Brighton), G. Handcock (Hove), T. S. Taylor (Hailsham), W. L. Dickson (Brighton), I. Kinsley (Brighton), East Kent Division B.M.A., F. E. Feilden (Hove), H. J. McCurric (Hove), John Kerr (Bexhill-on-Sea), and J. F. Atkins (Hove), £55; West Riding of Yorkshire Panel Committee, £10 10s.; Bath Division B.M.A., £20; Darlington Panel Committee, £2 2s.; Kent Panel Committee, £100; E. Lewis Lilley (Leicester), £1 1s.; Sheffield Panel Committee, £25; Shropshire Local Medical and Panel Committee, £10; R. G. McGowan (Manchester), £2 2s.; East Sussex Medical Committee, £210. Total £967 8s. 6d.

Cheques should be made payable to the Fothergill Testimonial Fund, and addressed to the treasurer, Fothergill Testimonial Fund, British Medical Association, B.M.A. House, Tavistock-square, London, W.C.1.

ROYAL SURREY COUNTY HOSPITAL.—At present this hospital is run at a loss of £2500 per annum and two new wards are being added to cope with the long waiting-list. To maintain these and the nurses' home an additional income of about £4000 will have to be obtained. This means that in all an additional yearly income of £6500 or £7000 must be found if the hospital is to be clear of debt.

MEDICAL NEWS

University of Oxford

On Feb. 29th the degree of D.M. was conferred on C. Wilson and of B.M. on J. F. Loutit.

University of London

Mr. Wilfred Trotter, F.R.S., has been appointed to the university chair of surgery at University College Hospital medical school.

Mr. Trotter, who is 63 years of age, was educated at University College where he graduated M.B. with first-class honours and was awarded the gold medal in 1896. He also received a gold medal and the university scholarship in surgery on taking the B.S. degree in 1899, and after obtaining other qualifications was appointed surgical registrar and lecturer in surgery at University College Hospital in 1901. Five years later he joined the honorary staff of the hospital and also of the East London Hospital for Children. A subsequent appointment, for a time, to the West End Hospital for Nervous Diseases, showed his bias towards neurological surgery and its underlying physiology, but he has also worked and reported on the surgery of the mouth and pharynx, on goitre, and on other and various subjects. His book on "Instincts of the Herd in Peace and War," which first appeared in 1916, has won him a collateral reputation as a biologist, and his published works include the Hunterian oration of 1932 and many lectures and addresses delivered before colleges and societies. Mr. Trotter is a member of the council of the Royal College of Surgeons of England and served on the Medical Research Council from 1929 to 1933. In 1928 he was appointed honorary surgeon to King George and in 1932 serjeant surgeon. He holds honorary doctorates from the Universities of Edinburgh and Liverpool and was elected F.R.S. in 1931.

The Graham Legacy committee have awarded a gold medal to Sir Thomas Lewis for research in connexion with the treatment of cardiac disease conducted at University College Hospital and medical school.

Prof. William Bulloch, F.R.S., has been appointed Heath Clark lecturer for the year 1936.

The title of Fellow of University College, London, was conferred on Dr. H. P. Himsworth, Mr. R. J. Ludford, D.Sc., Dr. Arthur MacNalty, and Mr. Julian Taylor.

University of Dublin

Mr. J. K. Jamieson, professor of anatomy and dean of the medical school at the University of Leeds, has been appointed to the chair of human anatomy and embryology at Trinity College, where he has for some time been examiner. He succeeds the late Dr. A. F. Dixon.

British Postgraduate Medical School

On March 17th, at 2.30 p.m., Dr. Leonard Colebrook will repeat the lecture on puerperal sepsis which he gave on March 2nd. The lecture is one of a course on recent advances in obstetrics and infant hygiene which is being given at the school, Ducane-road, Hammersmith, London, W.

New Ophthalmic Clinic

The King Edward Memorial Hospital, Ealing, is now providing a clinic in connexion with the Voluntary Hospitals Ophthalmic Clinic Scheme. It is held on Wednesday afternoons, and is open to members of approved societies and to contributors to the Hospital Saving Association. Those with incomes below a certain scale may also attend and are charged a fee of half a guinea and the cost of any spectacles prescribed.

Epsom College

The council of the College will shortly award a St. Anne's scholarship of £60 a year to an orphan girl, not less than nine years of age on July 15th, 1936, who is the daughter of a medical man who was at least five years in independent practice in England or Wales. Application must be made by May 15th on a form to be had from the Secretary of the College, 49, Bedford-square, London, W.C.1.

The council will also shortly award a Grewcock pension of £70 a year to a retired medical man who from old age, permanent incapacity from illness, reduced circumstances, or other cause is in need of it. There is no limitation as to age, but special consideration will be given to the claims of candidates having association with Worcestershire, Lincolnshire, or Carmarthenshire. Forms of application, which must be returned by the middle of May, can be had from the secretary.

Dr. William Warburton Pemberton has been appointed sheriff of Cambridgeshire and Huntingdonshire for the year 1936.

ON Monday, March 9th, the offices of the Radium Commission will be removed from 5, Adelphi-terrace, W.C.2, to 18, Park-crescent, Portland-place, W.1.

Institute of Psycho-Analysis

Dr. Ernest Jones will preside at three lectures on the emotional life of civilised men and women which will be given at the Caxton Hall, S.W., at 8.30 p.m. on Thursdays, March 12th, 19th, and 26th. The subject of the first lecture, by Dr. Sylvia Payne, is *Work and its Meaning for Us*. Tickets may be had from the secretary of the institute, 36, Gloucester-place, W.

Catholic Medical Congress

The second international congress of Catholic physicians meets in Vienna from May 28th to June 2nd, and the main subject for discussion will be eugenics and sterilisation. Full information may be had from The Oesterreichisches Verkehrsbureau, Friedrichstrasse 7, Vienna.

Nottingham General Hospital

To commemorate his 70th birthday Mr. W. G. Player has given £1000 to this institution.

Legacy for Swansea General Hospital

Mrs. Sarah Powell has left the residue of her estate, which is expected to amount to some £20,000, to this hospital. The money is to be used to build a new ward in memory of her brother, the late Sir Samuel Evans, and herself.

Clacton and District Hospital

The Silver Jubilee extensions to this hospital, which was built in 1899 to commemorate Queen Victoria's Diamond Jubilee, will be ready for opening by Easter. The extensions have cost about £10,000 and more money is needed to equip and furnish them. They include wards for abnormal maternity cases, electrical and massage departments, and an administrative block.

Hunterian Society

The gold medal which this society awards annually for the best essay written by a general practitioner has for the first time been given to a practitioner resident outside Great Britain. The subject set for 1935 was the conduct of midwifery in general practice, and the prize essay was submitted by Dr. Francis Bennett, of Christchurch, New Zealand. The subject chosen for 1936 is rheumatoid arthritis, its diagnosis, treatment, and end-results, and for 1937 the prognosis and care of heart disease in general practice. Further particulars may be had from the hon. secretary of the society, Mr. Arthur Porritt, 27, Harley-street, London, W.

Fellowship of Medicine and Post-Graduate Medical Association

Courses arranged for M.R.C.P. candidates are as follows: chest diseases, Brompton Hospital (March 10th to April 4th); chest and heart diseases at the Royal Chest Hospital (March 15th to April 4th). A demonstration on the fundus oculi will be given at the West End Hospital for Nervous Diseases on Tuesday, March 31st, at 8.30 p.m.; and a course in orthopedics at the Royal National Orthopaedic Hospital from March 9th to 21st; and in infant's diseases from March 30th to April 4th. Week-end courses include chest diseases, at the Brompton Hospital (March 7th and 8th); clinical surgery, at the Royal Albert Dock Hospital (March 14th and 15th); general medicine, at the Miller General Hospital (March 21st and 22nd); and urology, at the All Saints' Hospital (March 28th and 29th). Four lectures on diseases of children will be given by Dr. Reginald Lightwood at the National Temperance Hospital on March 25th, 27th, April 1st and 3rd at 8.30 p.m. Lectures are open only to members and associates, and further particulars may be had from the secretary of the fellowship, 1, Wimpole-street, W.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, March 9th.

United Services. 4.30 P.M. Squadron Leader R. H. Stanbridge: Occupational Selection of Aircraft Apprentices.

TUESDAY.

Therapeutics and Pharmacology. 5 P.M. Dr. G. Graham and Dr. S. Levy Simpson: The Treatment of Addison's Disease with Salt. Dr. E. N. Allott: The Effect of Treatment on the Blood Chemical Changes in Addison's Disease. Dr. Audrey Baker and Dr. Margaret Wright: The Vitamin B₁ Content of Human Diet.

Psychiatry. 8.30 P.M. Dr. Alfred Meyer: The Selective Regional Vulnerability of the Brain and its Relation to Psychiatric Problems.

WEDNESDAY.

Surgery: Sub-section of Proctology. 5 P.M. Mr. J. P. Lockhart-Mummery: 1. Spindle-celled Sarcoma of Buttock Treated by Radium. No Recurrence two years later. 2. Recurrence after Local Excision of Adenoma of Rectum. Mr. Lionel E. C. Norbury: 3-4. Extensive Papilloma of Rectum Removed by Perineal Excision. 5. Extensive Papilloma of Pelvic Colon Removed by Paul's Operation. Dr. Cuthbert Dukes: 6. Lymphatic Spread of Cancer of the Rectum. 7. Derivation of Fistulae from Intramuscular Glands. 8. Misplaced Epithelium (possibly Pancreas) within the Rectum. Mr. O. V. Lloyd-Davies: 9. Villous Papilloma of the Rectum.

FRIDAY.

Ophthalmology. 5 P.M. (Moorfields Eye Hospital, City-road, E.C.1), Mr. H. B. Stallard: 1. Sarcoma. 2-3. Glioma. 4-6. Coats' White Rings of the Cornea. Mr. F. A. Juler: 7. Congenital Retinal Fold. 8. Angioma of Orbit.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.

MONDAY, March 9th.—8.30 P.M., Mr. A. Dickson Wright: Phlebitis and its Treatment.

HARVEIAN SOCIETY OF LONDON.

THURSDAY, March 12th.—8.30 P.M. (Manson House, 26, Portland-place, W.), Dr. H. Letheby Tidy: Treatment of Gastric and Duodenal Ulcer. (Harveian Lecture.)

WEST KENT MEDICO-CHIRURGICAL SOCIETY.

FRIDAY, March 13th.—8.45 P.M. (Miller General Hospital, Greenwich, S.E.), Dr. Harold Crampton: The Unexpected in Anaesthesia.

SOUTH-WEST LONDON MEDICAL SOCIETY.

WEDNESDAY, March 11th.—9 P.M. (Bolingbroke Hospital, Wandsworth Common), Dr. W. E. Lloyd: Clinical Meeting.

NORTH LONDON MEDICAL AND CHIRURGICAL SOCIETY, Royal Northern Hospital, N.

FRIDAY, March 13th.—9 P.M., Dr. J. L. Livingstone: Asthma.

PADDINGTON MEDICAL SOCIETY.

TUESDAY, March 10th.—9 P.M. (Paddington Tuberculosis Clinic, 20, Talbot-road, W.), Dr. H. W. A. Post: X Ray Films.

BIOCHEMICAL SOCIETY.

FRIDAY, March 13th.—2.30 P.M. (University College, Gower-street, W.C.), Short Communications and Demonstrations.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY.

THURSDAY, March 12.—8.30 P.M. (11, Chandos-street, W.), Sir Walter Langdon-Brown: The Place of Psychology in the Medical Curriculum.

NORTH-WEST LONDON MEDICAL SOCIETY.

TUESDAY, March 10th.—9 P.M. (Regal Rooms, Finchley-road, Golders Green), Dr. John Freeman: Immunology in General Practice.

LONDON JEWISH HOSPITAL MEDICAL SOCIETY, Stepney Green, E.

THURSDAY, March 12th.—4 P.M., Sir Edmund Spriggs, Dr. B. S. Nissé, Dr. J. B. Mennell, and Dr. F. Nagelschmidt: Rheumatism.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.

TUESDAY, March 10th, and THURSDAY.—5 P.M., Dr. R. A. McCance: Medical Problems in Mineral Metabolism. (Goulstonian Lectures.)

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields.

FRIDAY, March 13th.—5 P.M., Dr. L. W. Proger: Specimens illustrating Tumours of the Kidney.

INSTITUTE OF HYGIENE, 28, Portland-place, W.

WEDNESDAY, March 11th.—3.30 P.M., Prof. Winifred Cullis: Women in Industry.

ROYAL INSTITUTION, 21, Albemarle-street, W.

TUESDAY, March 10th.—5.15 P.M., Prof. Edward Mellanby, F.R.S.: Drug-like Actions of some Foods.

SIR CHARLES HASTINGS LECTURE.

TUESDAY, March 10th.—8 P.M. (B.M.A. House, Tavistock-square, W.C.), Prof. Winifred Cullis and Dr. R. Cove-Smith: Keeping Fit.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.

MONDAY, March 9th.—3.30 P.M., Prof. F. J. Browne: Toxemias of Pregnancy.

WEDNESDAY.—3.30 P.M., Mr. Eardley Holland: Haemorrhage of late Pregnancy (II).

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

MONDAY, March 9th.—10 A.M., Skin clinic. 11 A.M., Surgical wards. 2 P.M., Gynaecological and surgical wards, gynaecological and eye clinics. 4.15 P.M., Mr. Green-Armytage: Fevers of Pregnancy.

TUESDAY.—10 A.M., Medical wards. 11 A.M., Surgical wards. 2 P.M., Throat clinic. 4.15 P.M., Mr. Simpson-Smith: Minor Surgical Problems.

WEDNESDAY.—10 A.M., Children's ward and clinic. 11 A.M., Medical wards. 2 P.M., Eye clinic, gynaecological operations.

THURSDAY.—10 A.M., Neurological and gynaecological clinics. Noon, Fracture clinic. 2 P.M., Eye and genitourinary clinics. 4 P.M., Venereal diseases.

FRIDAY.—10 A.M., Medical wards and skin clinic. Noon, Lecture on treatment. 2 P.M., Throat clinic.

SATURDAY.—10 A.M., Children's and surgical clinics, Medical wards.

Daily, 2 P.M., Operations, Medical and Surgical Clinics. The lectures at 4.15 P.M. are open to all medical practitioners without fee.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, March 9th, to SUNDAY, March 15th.—INFANTS HOSPITAL, Vincent-square, S.W. Mon., Wed., and Fri., 8 P.M., Primary F.R.C.S. course in anatomy and physiology.—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W. M.R.C.P. Clinical and pathological course. Tues. and Thurs. at 8 P.M. Tues., 8.30 P.M., Mr. T. Holmes Sellors: Thorax. Thurs., 8.30 P.M., Mr. R. Coyte: Large Intestine and Rectum. M.R.C.P. Clinical and pathological course at 8 P.M.—ROYAL NATIONAL ORTHOPAEDIC HOSPITAL, Great Portland-street, W. All-day course in orthopaedics.—BROMPTON HOSPITAL, S.W. Mon., Tues., Thurs., and Fri., 5 P.M., M.R.C.P. class.—ROYAL ALBERT DOCK HOSPITAL, S.E. Sat. and Sun., course in clinical surgery.—Courses are open only to members of the Fellowship.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, S.W.

WEDNESDAY, March 11th.—4 P.M., Mr. Leonard Phillips: Puerperal Sepsis.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westminster-street, W.

TUESDAY, March 10th.—5.30 P.M., Dr. B. T. Parsons-Smith: Cardiac Breathlessness.

HAMPSTEAD AND NORTH WEST LONDON GENERAL HOSPITAL, N.W.

WEDNESDAY, March 11th.—4 P.M., Dr. H. M. Oddy: Some Aspects of Arterial Disease.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

WEDNESDAY, March 11th.—2 P.M., Dr. Alan Moncrieff: Epituberculosis and Hilum Tuberculosis. 3 P.M., Dr. D. N. Nabarro: Human and Bovine Tubercle.

Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, March 9th.—3.30 P.M., Dr. Symonds: Head Injuries (I).

TUESDAY.—3.30 P.M., Mr. Julian Taylor: Spinal Compression.

WEDNESDAY.—3.30 P.M., Dr. Kinnier Wilson: Clinical Demonstration.

THURSDAY.—3.30 P.M., Dr. Riddoch: Cerebral Tumours.

FRIDAY.—3.30 P.M., Dr. Purdon Martin: Demyelinating and Toxic Diseases of Nervous System.

Out-patient clinics daily at 2 P.M.

LEEDS GENERAL INFIRMARY.

TUESDAY, March 10th.—3.30 P.M., Dr. Towers: Faintness and Vertigo: Demonstration of Cardiac Cases.

MANCHESTER ROYAL INFIRMARY.

TUESDAY, March 10th.—4.15 P.M., Dr. J. Wharton: Iritis and Glaucoma.

FRIDAY.—4.15 P.M., Dr. Crighton Bramwell: Demonstration of Cardiac Cases.

ANCOATS HOSPITAL, Manchester.

THURSDAY, March 12th.—4.15 P.M., Dr. E. D. Gray: A Study of Chest Radiograms.

UNIVERSITY OF DURHAM.

SUNDAY, March 15th.—10.30 A.M. (Newcastle General Hospital), Mr. G. F. Duggan: Surgical Cases.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.

WEDNESDAY, March 11th.—4.15 P.M. (Royal Maternity and Women's Hospital), Dr. R. A. Lennie: Ante-natal Care.

WEST CORNWALL MINERS' AND WOMEN'S HOSPITAL, REDRUTH.—New quarters for nurses were opened at this hospital on Feb. 18th. There are five bedrooms, which are centrally heated and have hot and cold water. The cost of the extension has been about £1000.

NOTES, COMMENTS, AND ABSTRACTS

POISONS FOR RODENTS

A TECHNICAL discussion on poisons for rodents was held at the College of the Pharmaceutical Society on Feb. 27th, under the auspices of the University of London Animal Welfare Society. Prof. J. H. Burn presided. It was made clear that the society did not propose to advocate any particular policy or to conduct propaganda at this meeting, but merely to survey the available information. The object of the discussion was to explore the feasibility of selecting and devising poisons for rats and other rodents which should cause as little suffering as possible. Mr. J. G. Wright, lecturer in surgery and materia medica at the Royal Veterinary College, summarised the pathological effects of hydrocyanic acid gas, and bait poisons including arsenic trioxide or potassium arsenite, phosphorus, strychnine, salts of thallium, barium carbonate, and red squill. All except the last two of these figure in Part I. of the list of poisons drawn up by the Poisons Board, and barium carbonate is in Part II. of the list, so that only red squill would be available for unrestricted distribution to the public. All the prohibited poisons produced severe and prolonged suffering. Red squill, when freshly and correctly prepared, was perhaps the least inhumane of the poisons that could be effectively used. It was specific for rats, more toxic for females than for males, and had little effect on domestic animals or man. The toxic principle contained in red squill was different from and additional to the glucosides which gave the drug therapeutic value. The essential action was upon the central nervous system. Symptoms were delayed for several hours after ingestion and began as a paralysis of the hind limbs, which progressively became more generalised, and were accompanied by convulsions of varying intensity, during which the animal might throw itself about. Death occurred in from one to three days from asphyxia following paralysis of the respiratory centre. Mr. Wright suggested as a useful line of research the search for a narcotic that could be combined with red squill, in order to provide unconsciousness during the onset of painful symptoms. Hydrocyanic acid, used for fumigating rabbits and rats in burrows, was the most rapidly acting poison known.

Mr. J. D. Hamer, consultant chemist to the Orient Line, put the poison question in due perspective by describing first the urgent reasons for combating the rat menace and secondly the normal methods employed for this purpose. The most important of these were rat-proofing of premises, elimination of nesting sites and supplies of food and water, and fumigation with hydrogen cyanide (which in view of its toxicity required skilled handling except in the open air). Traps and poison baits were relatively inefficient; if any were to be used he preferred red squill. Bacterial poisons he rejects as unsafe. Mr. T. Howard described the technique of the methods of baiting requisite to outwit the extremely high intelligence of the rat. He favoured a quick-acting poison of high toxicity, but such poisons could not be sold to the general public and were available only to the professional rat-catcher.

In the course of the general discussion which followed, a suggestion was made that research should be undertaken with the object of identifying the rat-toxic principle of red squill and of synthesising a kindred compound which by acting more rapidly would cause a more humane death.

THE COMMON COLD AGAIN

ANOTHER symposium on this vexed and vexing problem appears in the *Health Examiner* (published by the New York Academy of Medicine) for January, 1936. The authors are Dr. Russell L. Cecil, Dr. Yale Kneeland, Jun., and Dr. Walter L. Niles, all of New York. Dr. Cecil's foreword does not carry us far.

Having stated confidently that exposure to cold is the surest way to catch a cold, he devotes the rest of his article to a discussion of the treatment of pneumonia. Dr. Kneeland's contribution is more to the point. He holds the rational and modern view that the causa causans of the common cold is a filtrable virus which is, or may be, subsequently aided and abetted by the common pathogenic organisms present in the respiratory passages. In support of this view he quotes the work of T. H. Paul and H. L. Freese on the inhabitants of Spitzbergen who, during the seven months of the year in which they are ice-bound and so isolated from the rest of humanity, do not suffer from colds. In Dr. Kneeland's opinion, the solution of the problem lies in effectively immunising the human race against the virus. Dr. Niles suggests that the way to avoid colds would be to live in regions where they are infrequent; but would not the result of following such advice be to introduce colds into those happy regions? He holds that the public are still insufficiently alive to the seriousness of the cold as a communicable disease which, he thinks, should be handled in a manner similar to measles or scarlet fever. With regard to treatment he has nothing very new to offer. Many will agree with him when he says that there is a tendency to over-treat infected mucous membranes with ephedrine or cocaine. He is inclined to look with favour on the treatment of the cold by morphia or other alkaloids of opium as advocated by Diell and certain French physicians.

DEFENCE AGAINST AIR RAIDS

THE air raid precautions department of the Home Office has issued a circular to local authorities on "Anti-gas Training," and a leaflet on "Rescue Parties and the Clearance of Débris." These are obtainable from H.M. Stationery Office at 1d. and 2d. respectively. The circular states that a civilian anti-gas school will shortly be established at Eastwood Park, Falfield, Gloucestershire, and that local authorities and other responsible bodies will be expected to arrange for instruction to be given in their areas by persons who have obtained certificates after undergoing a general course of at least a fortnight at this school. Specialist one-week courses will also be given to doctors and nurses and to suitably qualified chemists. The first five courses at the school will be devoted to police and fire brigade instructors, but vacancies can be provisionally allotted for the whole of the first year. The memorandum on rescue parties forms part of a considerable series of official pamphlets and handbooks now in course of publication.

We have also received a copy of a monthly review described in a covering letter as the only journal in Bulgaria devoted to chemical warfare and the treatment of poison gas casualties. Its title, in French, is *Défense de Gaz. et l'Aéronautique*, and it is published from Boulevard Ferdinand 90, Sofia.

MINISTERING ANGELS ON HORSEBACK

THE condition of rural midwifery in the United States still leaves much to be desired. A recent report¹ on Brunswick County, Va., expresses the opinion that many of the rural midwives there are physically and mentally unfit to practise. No such criticism, however, is true of Kentucky where Mrs. Mary Breckinridge founded the Frontier Nursing Service in 1925. This service now covers an area of more than 700 square miles. There are nine nursing centres and some thirty nurses who, owing to the nature of the country, have to travel about

¹ U.S. Public Health Reports, Dec. 27th, 1935. *The Rural Midwife: Her Social and Economic Background and Her Practices as Observed in Brunswick County, Va.* By Josephine L. Daniel, Research Worker in Child Hygiene and Public Health Nursing; and William M. Gatafer, Senior Statistician, United States Public Health Service.

on horseback. The service also includes a medical director, an 18-bed hospital, and, during the summer months, a dentist. In addition there are a social worker, a statistician, and a volunteer courier service. Though midwifery was the first and remains the primary function, the work has expanded and now includes the care of the sick of both sexes and all ages, social service, and education in preventive medicine and child welfare. Up to May, 1931, costs worked out at the remarkably low figure of \$10.92 a year per patient. During the great drought of 1930, which brought dysentery, typhoid, small-pox, diphtheria, pneumonia, and influenza in its train, the nurses covered an area of 1000 miles, tending the sick and chlorinating wells. This admirable service is an example of what can be done by courage and enterprise in remote areas.

A GUIDE TO INCOME-TAX PROBLEMS

THERE exist full-dress text-books on income-tax for experts, heavy loads of information usually at a heavy price, containing every word of the Income Tax Act and of the amending sections in annual Finance Acts, annotated with every decided case. The "Income Tax Guide," by Mr. John Burns,¹ is of less formal character: a convenient summary which the tax-payer can study for himself, clearly written and inexpensive. In the new edition, miraculously shorter even than its predecessor, the main change is the substitution of the new scale of reliefs under last year's Finance Act. Chancellors of the Exchequer have promised simplification of the law. The committee of experts, set up by Mr. Winston Churchill several years ago, has its report and its draft code in type; it is possible that the existing enactments will be consolidated in an improved form in a year or two. Meanwhile there are few tax-payers who do not need guidance; within its own range Mr. Burns's little book will be found serviceable. It contains pages of special interest to doctors and dentists.

NEW PREPARATIONS

"IOZO" WHITE STAINLESS IODISED OINTMENT contains 6 per cent. of potassium iodide and 3 per cent. of methyl salicylate in a neutral saponaceous base. It leaves no mark on the skin and is recommended for external application in cases of rheumatic pain, chilblains, cuts, bruises, burns, and other conditions. The makers are Christopher, Stanley and Co., Ltd., Thames House, Millbank, London, S.W.1.

PETEIN is a whooping-cough vaccine, for intramuscular injection, prepared by Schering-Kahlbaum A.G., of Berlin, and sold in this country by Schering Ltd., 188, High Holborn, W.C.1. About 60 distinct strains of *Hæmophilus pertussis*, collected in various epidemics, are used in its composition, and care is taken to preserve their activity. The principal advantage claimed for Petein, as compared with other whooping-cough vaccines, is that the bacterial toxin has been removed from the bacterial cells, which makes it "entirely innocuous" even in large doses. The detoxication of each batch is verified by intradermal inoculation into guinea-pigs or rabbits, and is considered satisfactory if the animal shows no reaction after receiving double the maximum dose employed in man. The course advised is four injections, administered on alternate days, ranging from 0.25 to 1.0 c.cm. (total 2.5 c.cm. = 50 million organisms). According to the manufacturers such a course is useful not only for prophylaxis but also for the treatment of whooping-cough, as late as the early stages of the convulsive phase of the cough. The benefit is observed 3-4 days after the last injection; at this point "the severe paroxysms of coughing and the vomiting cease abruptly," though occasionally the paroxysms may have been aggravated for a time during the actual treatment. The only other untoward effect noted is that rarely the fourth injection

leads to a slight rise of temperature with some local pain, both being attributed to the protein present in the vaccine. In support of their claims Messrs. Schering quote observations by E. Krüger (1934) and M. Richter (1934); but these are suggestive rather than conclusive.

A-B-D CAPSULES, made by Abbott Laboratories Ltd., of Montreal (52A, Wigmore-street, London, W.1), are soluble gelatin capsules containing a preparation of fish-liver oils and yeast rich in vitamins A, B₁, B₂, and D. It is stated that each is equivalent in A and D content to at least three teaspoonfuls of cod-liver oil (U.S. Pharmacopeia, 1934), and in B₁ content to about an ounce of moist compressed yeast. Expressed more accurately each capsule supplies not less than 6200 units of vitamin A and 900 units of vitamin D (U.S.P.), and not less than 45 Sherman units of vitamin B₁ and 10 Sherman units of vitamin B₂. Since these factors are "often obtained in inadequate amounts from the diet" Messrs. Abbott maintain that their administration is "essential for good health and well-being." The average dose proposed is 1 to 3 capsules daily or more during pregnancy and lactation.

BROM-NEVACIT, described as a nerve tonic, consists of potassium bromide 4 per cent., sodium phosphate 0.1 per cent., barbitone 0.33 per cent., phenazone 0.67 per cent., and alcohol 7.5 per cent., with flavouring of saccharin caramel, orange, and quinine. The manufacturers, Brom-Nevacit Ltd. (47, Crogsland-road, London, N.W.1), claim that their mixture has a soothing and curative influence on nervous disorders without unpleasant or harmful after-effects.

A CORRESPONDENT inquires whether any convalescent home is known to our readers which would admit a hospital patient with a suprapubic cystostomy between the two stages of an operation for enlarged prostate.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED FEB. 22ND, 1936

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2536; diphtheria, 1265; enteric fever, 29; acute pneumonia (primary or influenzal), 1621; puerperal fever, 50; puerperal pyrexia, 110; cerebro-spinal fever, 31; acute poliomyelitis, 11; encephalitis lethargica, 7; dysentery, 34; ophthalmia neonatorum, 71. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Feb. 28th was 4910, which included: Scarlet fever, 975; diphtheria, 1062; measles, 1498; whooping-cough, 720; puerperal fever, 18 mothers (plus 14 babies); encephalitis lethargica, 283; poliomyelitis, 4. At St. Margaret's Hospital there were 28 babies (plus 14 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox or enteric fever, 78 (11) from measles, 10 (1) from scarlet fever, 37 (12) from whooping-cough, 39 (8) from diphtheria, 59 (15) from diarrhoea and enteritis under two years, and 119 (10) from influenza. The figures in parentheses are those for London itself.

The mortality from influenza has risen a little, the total deaths for the last twelve weeks (working backwards) being 119, 97, 85, 98, 104, 89, 110, 110, 80, 67, 62, 45. The deaths this week are scattered over 56 great towns, Manchester reporting 8, Leeds 6, Blackburn and Birmingham each 4, Ilford, Southgate, Blackpool, Hull, Sheffield, Coventry, and Nottingham each 3, no other great town more than 2. Liverpool reported 16 deaths from measles, Manchester 14, Warrington 5, Bradford, Salford, and Bristol each 4. Deaths from diphtheria were reported from 20 great towns: 3 each from Bradford, Hull, and Warrington, 2 each from Leeds, Newcastle-upon-Tyne, Oldham, Sheffield, Wallasey, and Birmingham.

The number of stillbirths notified during the week was 283 (corresponding to a rate of 45 per 1000 total births), including 37 in London.

¹ Income Tax Guide. Ninth edition. By John Burns, Writer to the Signet. London: Sir Isaac Pitman Ltd. 1935. Pp. 214. 5s.

Appointments

CULLINAN, E. R., M.D., F.R.C.P. Lond., has been appointed Hon. Physician to the Gordon Hospital, Vauxhall Bridge-road, London.

FINLAYSON, D. I. C., M.B., F.R.C.S. Edin., Resident Medical Officer and Registrar at the Birmingham Maternity Hospital.

HEALEY, F. H., M.D. Birm., D.P.M., Senior Assistant Medical Officer at the Somerset and Bath Mental Hospital, Cotford.

Vacancies

For further information refer to the advertisement columns

Aberdeen Royal Infirmary.—Surgical Registrar. £200.

Altrincham General Hospital.—Sen. H.S. At rate of £150.

Aylesbury, Bucks Mental Hospital, Stone.—Sen. Asst. M.O. £600. Also two Jun. Asst. M.O.'s. Each £350.

Bath and Wessex Children's Orthopaedic Hospital, Combe Park.—H.S. At rate of £120.

Bath Royal United Hospital.—H.S. At rate of £150.

Beckenham, Bethlem Royal Hospital, Monks Orchard.—Two Res. H.P.'s. Each £175.

Belfast, Royal Maternity Hospital.—Res. H.S. At rate of £100.

Birmingham City.—Asst. M.O. for Maternity and Child Welfare. £500.

Birmingham, Erdington House.—Deputy M.O. £800.

Birmingham, Little Bromwich Hospital for Infectious Diseases.—Jun. Res. M.O. £300.

Brighton, New Sussex Hospital for Women, Windlesham-road.—H.P. £100.

Bristol City and County, Child Guidance Clinic.—Psychiatrist. At rate of £500. Also Social Worker. £275.

British Postgraduate Medical School.—Two Cas. O.'s. At rate of £150.

Buxton, Devonshire Royal Hospital.—H.P. At rate of £150.

Canterbury, Kent County Mental Hospital, Chartham Down.—Med. Supt. £1000.

Cardiff Royal Infirmary.—H.S. to Ophth. Dept. At rate of £40.

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Two Hon. Assts. for Out-patient Dept.

Chadderton, U.D.—M.O.H., &c. £800.

Chester, Barrowmore Hall, Great Barrow.—H.P. At rate of £150.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—Physician to In-patients.

Colonial Medical Service.—Med. Supt. for Colonial Hospital, Port of Spain. £1400.

Croydon, Mayday Hospital.—Jun. Res. Asst. M.O. £300.

Derby, Breiby Hall Orthopaedic Hospital, near Burton-on-Trent.—Asst. M.O. At rate of £150.

Deunbury and District General Infirmary.—Second H.S. £150.

Dudley, Guest Hospital.—H.S. £200.

Eastbourne, Princess Alice Memorial Hospital.—Res. H.S. £150.

Edinburgh, General Board of Control.—Deputy Commissioner. £738.

Glasgow Eye Infirmary.—Res. H.S. Also Res. Asst. H.S. Each £100.

Gloucestershire Royal Infirmary.—H.S. to Ear, Nose, and Throat Dept. At rate of £150.

Great Western Railway Medical Fund Society, Swindon.—Chief M.O. £1200.

Guildford, Royal Surrey County Hospital.—Res. Surg. O. £250.

Hampstead General and N.W. London Hospital, Haverstock Hill, N.W.—Cas. M.O. for Out-patient Dept. At rate of £100.

Harrow Urban District.—Asst. M.O. £600.

Hertford County Hospital.—Hon. Clin. Asst.

Hospital for Sick Children, Great Ormond-street, W.C.—Res. H.P. and Res. H.S. Each at rate of £100.

Huddersfield County Borough.—Asst. M.O.H. £500.

Huddersfield Royal Infirmary.—H.P. and Res. Anaesthetist. Also H.S. Each at rate of £150.

Institute of Medical Psychology, Maltr-place, W.C.—Part-time Psychotherapist. At rate of £200.

Institute of Ray Therapy, &c., Camden-road, N.W.—Part-time M.O. At rate of £100.

Kent County Council.—Res. Asst. M.O.'s for County Hospital. Each £250.

Kent Education Committee.—Asst. M.O. £500.

Lancaster County Mental Hospital.—Asst. M.O. £500.

Leamington Spa, Warwick General Hospital.—Res. H.S. to Cas. and Spec. Depts. At rate of £150.

Leyton Borough, Education Committee.—Part-time Orthoptic Worker. 15s. per session.

Lincoln County Hospital.—Jun. H.S. At rate of £150.

London County Council.—Temp. District M.O. At rate of £290.

London Hospital, E.—Med. First Asst. and Recr. £300.

London University.—University Chair of Biochemistry. £1000. Also University Readership in Anatomy. £600.

Macclesfield General Infirmary.—Second H.S. At rate of £150.

Maidenhead Hospital.—Hon. Ophth. Surgeon.

Maulstone, County Pathological Laboratory.—Asst. Pathologist. £700.

Maidstone, West Kent General Hospital.—H.P. £175.

Manchester, Ancoats Hospital.—H.S. At rate of £100.

Manchester, St. Mary's Hospital.—Four H.S.'s. Each at rate of £50.

Mansfield, Harlow Wood Orthopaedic Hospital.—Two H.S.'s. At rate of £200.

Middlesex County Council.—Asst. M.O. £600.

Mount Vernon Hospital, Northwood, Middlesex.—Asst. Radiologist. £350.

Newcastle-upon-Tyne Royal Victoria Infirmary.—Jun. Surg. Reg. £150.

Newport, Mon, Royal Gwent Hospital.—Asst. Cas. O. Also two H.S.'s and H.P. Each at rate of £135.

Northampton General Hospital.—H.P., H.S.'s, also Cas. O. Each at rate of £150.

Northumberland County Council.—Asst. County M.O.H. £500.

Norwich, Jenny Lind Hospital for Children.—Res. M.O. £120.

Nottingham General Hospital.—H.S. for Fracture and Orthopaedic Dept. £300. Also H.S. to Ear, Nose, and Throat Dept. At rate of £150.

Plymouth, Prince of Wales's Hospital, Lockyer-street.—H.S. At rate of £150.

Plymouth, Prince of Wales's Hospital, Greenbank-road.—H.S. At rate of £120.

Port Said, British Hospital.—Principal M.O. £700.

Preston, Wroughton Hospital, Appley Bridge.—Jun. Asst. M.O. £200.

Princess Elizabeth of York Hospital for Children, Shadwell, E.—H.P. At rate of £125.

Queen's Hospital for Children, Hackney-road, E.—Clin. Asst. to Ophth. Dept. 5s. per session.

Rochdale Infirmary and Dispensary.—Second H.S. £150.

Ross Institute of Tropical Hygiene, Keppel-street, W.C.—M.O.'s for East Africa, &c.

Rotherham Hospital.—Cas. H.S. £150.

Royal College of Surgeons of England.—Examiners.

Royal National Orthopaedic Hospital, 234, Great Portland-street, W.—H.S. At rate of £150.

Royal Northern Hospital, Holloway, N.—H.S. At rate of £70.

St. Alban's and Mid Herts Hospital.—Res. H.S. £150.

St. Andrew's Hospital, Deacons-road, Bow, E.—Asst. M.O. £350.

Salisbury General Infirmary.—H.S. At rate of £125.

Scarborough Hospital and Dispensary.—Two H.S.'s. Each £175.

Sheffield Children's Hospital.—H.P. At rate of £100.

Sheffield, Jessop Hospital for Women.—Res. M.O. Also two H.S.'s. At rate of £150 and £100 respectively.

Sheffield University, Dept. of Bacteriology.—Jun. Asst. Bacteriologist and Demonstrator. £300.

South Shields, Ingham Infirmary.—Jun. H.S. £150.

Stockport Infirmary.—H.P. £150.

Sunderland Royal Infirmary.—H.P. £120.

Taunton and Somerset Hospital.—H.S. At rate of £100.

University College Hospital, Gower-street, W.C.—Asst. Radiologist. £200.

Uzbridge, Hillingdon County Hospital.—Jun. Res. Asst. M.O. At rate of £250.

Warrington Infirmary and Dispensary.—Third Resident. At rate of £150.

West London Hospital, Hammersmith-road, W.—H.P. and H.S. to Spec. Depts. and Res. Cas. O. Each at rate of £100. Non. Res. Cas. O. £250. Also Physician.

West Sussex County Council, &c.—Asst. County M.O.H., &c. £800.

Wolverhampton Royal Hospital.—H.S. for Orthopaedic and Fracture Dept. At rate of £100.

Wretham and East Denbighshire War Memorial Hospital.—Two Res. H.S.'s. Each at rate of £150.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Walton-on-the-Naze (Essex), Calvert (Buckingham), Croydon (Surrey), and Swanscombe (Kent).

Births, Marriages, and Deaths

BIRTHS

ANDERSON.—On Feb. 26th, at Brantree, the wife of Dr. David M. Anderson, of a daughter.

CAUGHEY.—On Feb. 29th, at Collingham-gardens, S.W., the wife of Dr. F. W. H. Caughey, of a daughter.

FERGUSON.—On March 1st, 1936, at York-place Nursing Home, Manchester, to Kathleen (née Wilson), wife of Fergus R. Ferguson, a son.

PEREIRA.—On Feb. 28th, at Alexandra Park, N., the wife of Dr. Harold Pereira, of a daughter.

REEVES.—On Feb. 27th, at Southsea, the wife of Dr. R. K. Reeves, of a son.

MARRIAGES

CLEGG—EASON.—On Feb. 22nd, at Southwark Cathedral, William Bernal Clegg, M.R.C.S. Eng., of Wilmslow, Cheshire, to Diana Clare, daughter of the late Hon. Mrs. Eason and of Mr. H. L. Eason, Superintendent's House, Guy's Hospital.

COPLAND—DOUGLAS.—On Feb. 27th, at the Caledonian Hotel, Edinburgh, James George Copland, M.D. Aberd., of Huddersfield, to Margaret Cruickshank Douglas, M.B., D.P.H., younger daughter of Mr. Joseph and the late Mrs. Douglas, Colinton, Edinburgh.

ELLMAN—SAMUELL.—On Feb. 27th, at the Liberal Jewish Synagogue, London, Philip Ellman, M.R.C.P. Lond., of Harley-street, W., to Betty, elder daughter of Mr. and Mrs. Albert L. Samuell, of Cumberland-terrace, Regent's Park, N.W.

DEATHS

BURNETT.—On Feb. 26th, at Keswick, John Ridley Burnett, M.D. Edin.

COAD.—On Feb. 27th, at Tunbridge Wells, John Edwin Coad, Surgeon Captain, R.N. (retired).

COPESTAKE.—On Feb. 29th, at Peckham Rye, London, Thomas Goodall Copestake, M.B. Glasg.

HODSON.—On Feb. 26th, at Canterbury, Eleanor Hodson, M.B. Edin., Chevalier Légion d'Honneur, Médaille d'Honneur, elder daughter of the late Mr. and Mrs. Hodson, of Mickleover, Derbyshire.

TAYLOR.—On Feb. 27th, at Deepdale, Scarborough, Edward Muscroft Taylor, L.R.C.P. Edin., aged 78.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

ADDRESSES AND ORIGINAL ARTICLES

THE NUTRITION QUESTION

BY ROBERT HUTCHISON, M.D., LL.D. Edin.,
F.R.C.P. Lond.

CONSULTING PHYSICIAN TO THE LONDON HOSPITAL

THE subject of nutrition is at present much to the fore; it may, indeed, be regarded as the public health "stunt" of the moment though maternal mortality runs it close. Unfortunately, too, it is a subject which has got badly mixed up with politics with the consequence that much of the writing about it in the lay and even in the medical press is of a tendentious character. This is a pity, for nutrition and its relation to health is a more complicated matter than is often realised and there is no subject which more requires cool and clear thinking.

What is Meant by Nutrition

At the outset we are met with the difficulty of defining our terms. According to the dictionary, nutrition is "the action or process of supplying or receiving nutriment," but this does not carry us very far. Perhaps one might describe normal nutrition as a state in which the intake of energy balances the output; in which the food contains enough protein and mineral matters for the purposes of growth and repair and in which the supply of the accessory food factors is adequate to prevent disease. But the "nutrition" of any individual is not a fixed and static thing; on the contrary it is, like health, capable of various degrees. If, for example, a man gains 5 lb. in weight is he necessarily better nourished than he was before? Or if he loses 5 lb. is his nutrition necessarily worse? What, in short, is the *optimum level* of nutrition? Should we aim, as some enthusiasts would have us do, at feeding children in such a way as to produce the maximum growth and development of which each child is capable? If we succeed in this are we sure we have benefited the child? Does maximum growth make for health and longevity? There is certainly some experimental evidence that it does not¹ and general experience seems to show that the tallest people are not the most robust and that the well-developed athlete is not necessarily a better "life" than the more fragile man. May it not be that the smaller and more wiry type fits in better with the conditions of urban life and a machine age?

These are only some of the questions to which there are as yet no agreed answers and although it might be true simply to say that optimum nutrition is that condition in which the body is at its highest pitch of vitality, there exists unfortunately no means of measuring that quality.

Assessment of Nutrition

There is, in fact, no accepted standard of nutrition in spite of many attempts to find one,² no "yardstick"—to use Prof. Cathcart's term—by which we can measure exactly what the state of nutrition in any individual is. The Quetelet Index or the relation of weight to height is, of course, of some help and it is probably true that if a child under 12 is less than 10 per cent. below or 20 per cent. above the average weight for his height he may be regarded as normal (Holt). But only quantitatively normal, for nutrition may be badly wrong in quality although

the body-weight is perfectly correct. We are thus driven to the conclusion that the state of nutrition can only be estimated in the same way as that of health; it is essentially a clinical problem to be determined by clinical methods. Unfortunately, however, it is just in the use of such methods that wide experience is most required and the personal equation of the observer counts for so much. It is not surprising therefore that the estimates by school medical officers of the amount of "malnutrition" in their districts vary considerably.

Assessment of Diets

It is sometimes assumed that although we cannot easily determine what *optimum* nutrition is, at least we can tell the kind of diet both in quantity and quality which can be guaranteed to produce it. Much of the criticism of present-day diets is based on this assumption, but is it correct? If we look at such a comparatively simple problem as energy requirement we find that three different committees of experts, appointed in recent years by the Ministry of Health, the British Medical Association, and the League of Nations respectively, have each recommended a different calorie value to maintain efficiency. There is even less agreement about the optimum protein intake. It was originally fixed by Voit at 120 g., and this figure was generally accepted at the beginning of this century until challenged by Chittenden. It is now often put at the round figure of 100 g., but we have the authority of Sir Gowland Hopkins for the statement³ that Cambridge undergraduates (not surely an under-nourished class) do not on an average consume more than 80 g., although a very high proportion of this is probably "first class." But here again we lack scientific guidance. There are some who say that half of the intake of protein should be of this superior kind, whilst others content themselves with recommending about a third. The point is one of importance, for first-class protein, being mainly of animal origin, adds greatly to the cost of the diet and yet there is no scientific justification for any positive pronouncement as to the exact amount of it required for optimum nutrition. If this is true of protein it is equally true of the mineral matters in the diet and of the "accessory factors"; estimates of the quantity of these required to maintain health are largely a matter of guesswork. If one adds to these uncertainties the inconstant composition of most foods and the doubtful allowance which has to be made for "waste" in the case of different individuals or households one sees on what shaky foundations our conception of an "optimum diet" is based.

In spite, however, of this absence of mathematical certainty in our criteria it is useful to distinguish between (1) "under-nutrition," meaning by that a state of things brought about by an inadequate intake of energy (calories), and (2) "malnutrition," a condition due to an ill-balanced diet or one deficient in building material or some of the accessory factors. Such a distinction, though convenient, is of course quite artificial, for in practice under-nutrition and malnutrition more often than not coexist.

Effects of Under-nutrition

It is commonly said that the effects of an insufficient intake of energy in the form of food is to lessen first activity and then resistance to disease. Such a statement needs qualification. It is amazing

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how much activity some grossly under-nourished persons exhibit—patients with anorexia nervosa for instance—and, as regards resistance to disease, clinical experience tends to show that under-nourishment must be very pronounced before any general lowering of resistance is brought about. There is only one disease, indeed, to which beyond all doubt under-nutrition, even of moderate degree, predisposes, and that is tuberculosis. It was the supervention of tuberculosis that one dreaded in the case of young diabetics who were treated in the pre-insulin days by Allen's starvation plan and that one dreads still in patients with anorexia nervosa. In Germany, during the food shortage of the war, the death-rate from tuberculosis rose enormously whilst that from diabetes (a disease of over-nutrition) fell. Even in this instance, however, there is some evidence that it is not a shortage of calories as such (i.e., under-nutrition) that weakens resistance but poverty of the diet in fat (i.e., malnutrition), though whether it is the fat itself that is important, or a vitamin of which fat is the vehicle, is undetermined. As regards other infections, there is little evidence that under-nourishment, at least in moderate degrees, favours their development. It does not seem to do so, for instance, in the case of acute rheumatic infection in childhood, or the common acute specific fevers, or *B. coli* infections or acute poliomyelitis, or infection by pyogenic organisms; indeed Dr. Friend⁴ records that at Christ's Hospital the health of the boys, as regards septic infections and possibly in some other respects, "was actually better during the period of restricted food supplies." There is more doubt about respiratory infections other than tuberculosis; at least there was an increased mortality from these in Germany during the time of food shortage just as there was from tuberculosis itself. On the other hand Chable,⁵ in an investigation in a Swiss canton where there was a large amount of unemployment, found no deterioration of health in spite of restricted rations, indeed it was better at all ages, and curiously enough there was even less tuberculosis. He attributes these results to the cessation of heavy manual work so that the diminished intake of food sufficed.

Effects of Malnutrition

If the effect of a moderate degree of *under-nutrition* in predisposing to disease is uncertain, it is even more difficult to estimate the consequences of *mal-nutrition*. Take, for instance, the case of protein. What, if any, are the ill-effects of living habitually on a protein minimum? We have no clear evidence to guide us to a decision. Some persons seem to be able to live normally for very long periods on a protein intake which is only about half the generally accepted standard, whilst others on the same allowance have complained after a time of "impaired health," lack of energy, and shortness of breath.⁶ The condition known as war oedema has also been attributed, rightly or wrongly, to protein shortage, but as regards the effect of the latter in predisposing to disease we really know very little. The same is even more true of the mineral constituents of the diet. That these are essential to life is of course beyond dispute, but as regards the consequences to health which follow the consumption of them in quantities below those fixed by dietitians as "standards" we really know very little. Shortage of iodine in the diet seems to produce goitre and lack of iron is sometimes—though usually (except in infancy) only in the presence of habitual losses of blood—a cause of anæmia, but is there any clinical

condition other than rickets and osteomalacia which can be attributed to a diet poor in calcium? Even these diseases, moreover, are usually brought about not by lack of calcium itself but of a sufficiency of vitamin D to enable the calcium to be utilised.

And what of malnutrition due to deprivation of the accessory factors (vitamins)? We know of course that absence of these (avitaminosis) results in the appearance of certain specific diseases—xerophthalmia, rickets and osteomalacia, beri-beri, scurvy. But what is the effect on health of ingesting only minimal quantities of vitamins (hypovitaminosis)? About this there has been a good deal of vague talk, emanating from experimentalists rather than from clinicians, so it will be as well to consider each vitamin separately.

Vitamin A has been proved to prevent xerophthalmia and night-blindness. Green and Mellanby⁷ found that a lack of it in the diet of experimental animals led to broncho-pneumonia, and they also advanced some evidence to show that its administration lessened the risk of puerperal infection in women. It was therefore labelled, rather hastily, the "anti-infective" vitamin, and began to be prescribed in concentrated form in all sorts of infections. The results, however, were not impressive, and subsequent clinical investigation on a large scale with adequate controls has shown that, in fact, vitamin A has no general "anti-infective" power except possibly as regards some mild infections of the skin.⁸

Vitamin B, of course, is not a single vitamin but a complex of more than one. One fraction of it has been proved to protect against beri-beri and another may possibly play a part in protecting against pellagra, but beyond these there are no definite diseases in man associated with a lack of it. Experimentalists have ascribed ill-defined disorders of the intestine to a shortage of this vitamin, but it may safely be said that no such association has been recognised by clinicians. Only the other day I was asked by a commercial traveller to believe that an artificial preparation of the vitamin-B complex which he was trying to sell was "good for neuritis." On cross-examination, however, he proved quite uncertain as to what variety of neuritis was meant. This is a good example of the way in which the vitamins are being exploited commercially on the strength of the most flimsy evidence.

Vitamin C protects against scurvy—that is proved—and the fact that scurvy, other than the infantile form, is now almost extinct in this country shows that our ordinary diet contains enough of it; much, probably, in that popular article, the potato. Here again attempts have been made to show that there are conditions of ill-health short of actual scurvy due to a scarcity of vitamin C in the diet, and some evidence has been brought forward that an increased fragility of the capillaries can be demonstrated in such circumstances. But do clinicians often see such cases, which would of course be bound to display themselves by bruising and extravasations on slight provocation? I think not. Even less convincing to the paediatrist I fancy will be the recent attempts to make out that deficiency of vitamin C plays a part in the production of acute rheumatism.

As a matter of fact the striking thing about ascorbic acid (vitamin C) is the very negative effect it seems to have on bodily functions and metabolism even when given in massive doses.⁹

Vitamin D prevents rickets and some of its com-

plications in the growing child, and may also, though less certainly, help in the building up of sound teeth, so during the early years of life a sufficient supply of it in the diet is of great importance. To the adult it is much less essential. Osteomalacia may be the consequence of a deficiency, but that is a very rare disease in this country, and there is no other clinical condition, so far as I know, which results from a shortage of it in the diet as distinct from a failure to utilise it.

The So-called Protective Foods

The term "protective foods" has been applied, rather unfortunately, to dairy products, green vegetables, and fruits on the ground that they protect us against disease and, as thought-saving catch-phrases so often do, it has caught on. But this group of foods is really no more deserving of the title "protective" than sugar and the other calorie-rich foods which, after all, protect us against starvation. The protective foods do prevent the development of a few specific maladies (though meat which is not included amongst them does so too), but there is no proof whatever that they protect us against any of the great killing diseases to which most of the mortality in this country is due.

Over-nutrition and Under-nutrition

The existence of any widespread under-nutrition in this country (always a priori unlikely, except perhaps in the "distressed areas") most official information contradicts, and the experience of practitioners in close touch with the poorer classes will probably confirm the contradiction. Against it also is the fact that diseases such as tuberculosis which are associated with under-nutrition are steadily declining, whilst the incidence of diabetes and cardiovascular disorders, which are associated with good nutrition, is increasing. Enthusiasts for feeding-up the community should take note of this, for over-nutrition has dangers to health almost as great as those of under-nutrition, though of a different kind, and hypervitaminosis is beginning to be recognised as well as hypovitaminosis.

Moreover, of the under- or mal-nutrition which exists a very large part is almost certainly not due to inability to get enough food of the right kind but to such factors as lack of appetite, the consequence of indoor occupation and urban life; to educational over-strain amongst children; and, as J. C. Spence found in the Newcastle district, to infective disease in early life (possibly favoured by overcrowding), recovery from which had never been complete. To these must be added nervous wear and tear and psychological factors in many instances. Sheer poverty, in short, is only one cause, and that probably not a common one of present-day malnutrition.

It may well be, of course, that expenditure upon food is often unwisely directed, and that there is much unnecessary waste. There is room here for educative propaganda, but he is a sanguine man who believes that it is easy to change by this or any other means the food habits and prejudices of a people.

Summary

I might summarise the purport of this paper in the statement that it is intended to be a protest: (1) against the pessimistic view, apparently so commonly held, that defective nutrition is widely prevalent in this country; and (2) against the undue optimism which believes that a great improvement in the public health can be brought about by altering the national diet.

(References at foot of next column)

SOME OBSERVATIONS ON PEPTIC ULCER*

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(Concluded from p. 526)

Gastric Secretion in Cases of Ulcer

Since experiment demonstrates that active gastric secretion is essential to the development of peptic ulcer in animals, it is difficult to explain the coexistence of achlorhydria and an active ulcer. We should expect to find in ulcer patients a juice possibly more copious and an acidity often higher than which is seen in normal people. Clinical experience unquestionably supports this view. Indeed it is well recognised among the more surgically minded that the higher the acidity the more the danger of further ulceration. While a gastro-enterostomy for carcinoma never results in secondary jejunal ulceration, this complication is not a rare sequel to operation for peptic ulcer, especially when the patient is young and the juice high in volume and acidity.

In an able review of 1435 ulcer patients, Emery and Monroe²⁴ were able to recall "no instance in which an ulcer gave characteristic symptoms in the absence of HCl." Brown²⁵ also recorded hyperacidity in 75 per cent., normal acidity in 22 per cent., and an acidity below 20 units in only 3 per cent.—an observation from a total of 1224. Palmer²⁶ likewise found free acid in all but 1 of 1004 ulcer patients. Hurst,²¹ Bennett,²⁷ and Venables,²⁸ have also drawn attention to the high acid secretion. More recently Pyrah²⁹ recorded the presence of free HCl in all but 1 of 197 duodenal ulcers.

Scott Pollard and Bloomfield^{30 31} in their accurate studies of gastric secretion maintain that in over 90 per cent. of ulcer cases there is an increase higher than the mean values, both in volume and acidity, as a result of histamine stimulation. At the same time they point out that while almost all patients with ulcer show this high acid and high volume secretion, similar values are also found occasionally in persons not suffering from this condition.

* The Bradshaw lecture for 1935, delivered before the Royal College of Physicians of London on Nov. 5th.

(Continued from previous column)

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Recently Osterberg and Vanzant³² have drawn attention to the high pepsin values which are specially found in duodenal ulcer when the symptoms are somewhat difficult to control. They also were able to show that highly nervous individuals with the ulcer syndrome but without an actual lesion showed similar high readings in the gastric secretion.

Gastric secretion varies with age. According to Vanzant³³ (in a study of 3746 records) gastric acidity reaches its maximum between the age of 20 and 40 in the male, but there is little fluctuation in the acid values in the female. Over the age of 60 there is a decline and an increasing incidence of anacidity. It is of interest to recall that the maximum incidence of benign ulcer is between 30 and 40 years, and that the male suffers more often than the female.

TABLE VI
Gastric Analysis in Ulcer

	G.U.	D.U.	Total.
Hyperacidity ..	37	76	113 (60%)
Normal acidity ..	47	27	74 (39%)
Achlorhydria ..	—	1	1

Among my patients 188 had gastric analyses, many of them repeatedly. We found hyperacidity in 60 per cent. and an acidity within the range of normal in 39 per cent. (Table VI.).

Only 33 of the 188 showed a resting juice volume below 40 c.cm., and 70 per cent. of the gastric and 92 per cent. of the duodenal cases showed a resting juice volume of above 40 c.cm. (Table VII.). In

TABLE VII
The Volume of Resting Juice

C.cm.	-40	40	60	80	100	120	160+
Gastric ulcer ..	27	25	19	12	4	2	1
Duodenal ,, ..	6	37	28	9	8	1	9
—	33	62	47	21	12	3	10

44 per cent. of the gastric and in 55 per cent. of the duodenal the resting juice was more than 60 c.cm. in volume. This increased volume of resting juice is readily apparent during aspiration, and the ease with which the juice is withdrawn from an ulcer patient contrasts with the frequent difficulty of obtaining 20 c.cm. in a normal person.

Special attention has been paid to the possible finding of achlorhydria. One woman with pyloric stenosis showed achlorhydria on first analysis which was later replaced by a normal acidity. Three women who complained of pains after food and who showed achlorhydria were reported as showing small gastric ulcer craters.

1. Aged 27. Pain after food for 20 months. Small crater reported on the lesser curve. Both the crater and symptoms disappeared. The resting juice volume was 48 c.cm., and histamine resulted in the secretion of 24 units of HCl as well as pepsin (256 units).

2. Aged 40. Pain after food for 8 years. Ulcer crater reported on posterior wall. "Crater" disappeared in one month, but symptoms persist. Achlorhydria to histamine. Resting juice 46 c.cm., pepsin 256 units.

3. Aged 56. Pain after food for 12 months. "Saucer-shaped" crater on posterior wall. Radiological signs and symptoms disappeared in 3 months. Achlorhydria persistent to histamine. Resting juice 54 c.cm., pepsin 256 units.

These brief records have been incorporated to show their unconvincing nature. In only the one with free HCl to histamine was the ulcer crater found in

the usual situation; in the other two it was described as on the posterior wall—an uncommon site. Although the symptoms were apparently relieved by medication in two, it is doubtful whether they should be included as patients suffering from peptic ulcer. In all probability they are examples of gastritis in which the radiological findings are not a little uncertain.

A more interesting example of achlorhydria is that of a man, aged 34, who first appeared complaining of vague indigestion in 1933. A barium meal disclosed no organic disease, but on gastric analysis achlorhydria persistent to histamine was discovered. Some symptomatic treatment was advised and he was well until the beginning of 1935. Pain, but of a more definite character and periodicity, returned. A further barium meal now showed a lesser-curve ulcer, and when a second gastric analysis was done a normal acid secretion was found. The crater and symptoms disappeared in two months. In this case the appearance of an ulcer crater was associated with the presence of free HCl in a person who previously had shown achlorhydria.

It is generally agreed that a high acidity is more often found in benign ulcer than in any other state. Within recent years attention has also been drawn to the dyspepsia of "nervous origin," in which the gastric secretion is copious in volume and of high acidity—the ulcer syndrome without an actual ulcer demonstrable. The exact mechanism of this hypersecretion is still sub judice. Some investigators attribute it to pyloric spasm and the absence of free alkaline regurgitation from the duodenum, while others believe that the hypersecretion is a manifestation of a constitutional type—the hypersthenic gastric diathesis of Hurst—a more or less permanent state.³⁴ It is very difficult to reconcile success in treatment with a belief in the persistence of hypersecretion and hyperacidity, if we are at the same time to attribute an essential part to gastric juice in the development of ulcer. Ulcers should only heal with difficulty and rarely, but the reverse is true. Is it possible that the hypersecretion and hyperacidity do diminish under certain favourable conditions?

TABLE VIII
Gastric Analysis in Recurrences
GASTRIC ULCER

—	Time of first analysis.	Type of secretion.	Time, type of further analysis.	Recurrence.
1	1st mth.	H., R J 76 c.cm.	12th mth. N. 20 c.cm. 2nd yr. H. 26 ..	+
2	1st "	H., R J 64 c.cm.	2nd mth. N. 30 6th " H. 84 ..	+
3	6 wks.	N., R J 84 c.cm.	4th yr. H. 98 ..	+
4	1st mth.	H., R J 45 c.cm.	12th mth. N. 15 .. 4th yr. H. 76 .. 5th " H. 58 ..	+ +
5	1st wk.	H., R J 60 c.cm.	6th mth. H. 41 .. 18th " H. 60 .. 3rd yr. N. 38 ..	C.T.

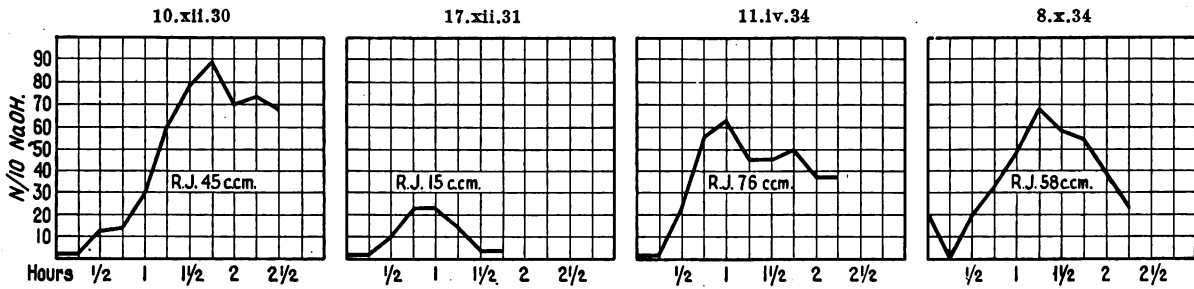
C.T. = Crater persisted until 13th month. Treatment commenced 12th month.

DUODENAL ULCER

1	1st mth.	H.	6th mth. H. 86 c.cm.	+
2	1st wk.	H., R J 50 c.cm.	1 yr. N. 32 .. 2½ yrs. H. 80 ..	+
3	2nd mth.	H., R J 52 c.cm.	14th mth. N. 32 .. 3 yrs. H. 78 ..	+
4	2nd wk.	H., R J 300 c.cm.	8th mth. N. 62 .. 2 yrs. H. 240 ..	+

H. = hyperchlorhydria. R J = resting juice. N. = normal acidity.

FIG. 12



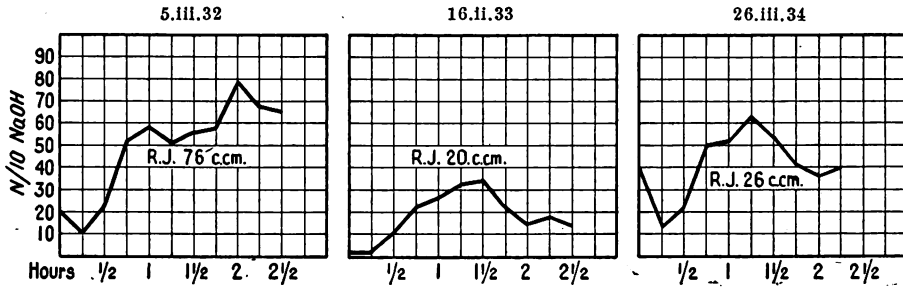
The gastric secretion was repeatedly examined over a course of three to four years in 52 of my patients, and it was found that a definite diminution both in acidity and volume was recorded in some of the analyses. The initial examination performed during the first six months of treatment showed the following distribution—hyperacidity in 42 and a normal acidity in 10. During the following four years only 13 showed a persistent hyperacidity, while as many as 39 did at some time or other show a normal acidity. The change occurred at varying periods, but several showed no change in the gastric secretion until the lapse of two years.

We were fortunate enough to obtain several records of some who suffered recurrences, both of symptoms and a return of crater. Table VIII. shows the types of secre-

toms; a recurrent ulcer and hyperchlorhydria, which has now persisted for some six months (Fig. 12).

B.—This man had hyperacidity and a lesser-curve ulcer in 1932, a normal acidity in 1933, and in 1934 a return of symptoms and hyperchlorhydria. He was

FIG. 13

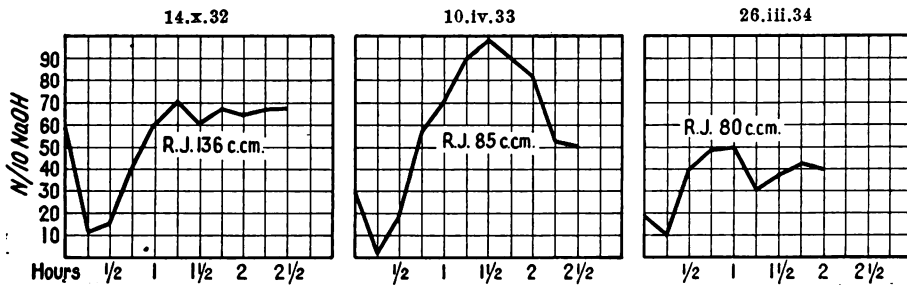


operated on, but the ulcer had healed and a scar was all that was left. In this case both symptoms and hyperacidity returned before the recurrence of the ulcer (Fig. 13).

C.—The third patient, a woman, had a duodenal ulcer with a high acidity in 1932. This persisted at the time of the second analysis and had diminished little twelve months later. We can expect this patient to be a ready prey to recurrence unless greater diminution in resting juice and acidity is recorded (Fig. 14).

D.—In 1933 the fourth patient had a duodenal ulcer with a characteristic acid secretion. Sixteen months later the acidity was much lower (Fig. 15).

FIG. 14



tion and the volume of resting juice in recurrent duodenal and gastric ulcers. Four examples may be given.

A.—This man showed hyperchlorhydria and a gastric ulcer in 1930, a normal secretion and no radiological abnormality in 1931, and in 1934, with a return of symp-

The number of repeated analyses is small, but nevertheless I think the results are of some significance. Under favourable conditions there is a diminution, both in acidity and volume, but the improvement may not be manifest for a year or more. Even then it may only be temporary, to be replaced by a hyperacidity with a recurrence.

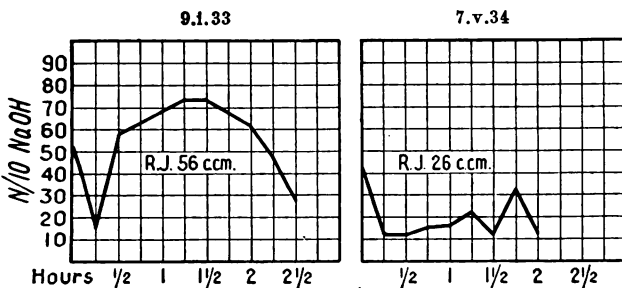
Is this fluctuation in acidity the reason for the spontaneous remissions and the long lasting relief from symptoms in people who have had the most inadequate treatment?

The return of hyperacidity in a recurrence is again in keeping with the experimental work on the importance of an active concentrated juice in the production of ulcer in animals.

The Emotional Factor

In the initiation of the ulcer lesion are we to believe that the nervous system plays an important

FIG. 15



part? We know that symptoms often precede ulcer development, and we know that such periodic symptoms are not uncommonly found in people under tension.^{34 35} The relief of the tension often brings silence in the abdomen. Can we—in a significant proportion of cases—recognise some such mental upset in the life of the individual preceding ulcer development and preceding a recurrence? From the experimental evidence it would be fair to presume that a deep emotional upset would be just as capable of stimulating the hypothalamic centre as would the more artificial electrical stimulation, which we already know is capable of producing hyperperistalsis and hypersecretion. Continued stimulation might be responsible for gastric erosions, hæmatemesis, and even ulceration.

The constitutional type has been well described by a number of observers (Hurst,²¹ Ryle,³⁶ Draper,³⁷ Rivers³⁸). Robinson³⁹ has recently described the man with ulcer as being in the firing-line of life's struggle, and Draper has convincingly shown that the ulcer patient is of a different mould to him with a gall-bladder lesion. The angularity of the body, combined with the dynamic energy, is characteristic. He works under tension with vigour and enthusiasm, and he is generally under-weight, an increase in weight being always a sure sign of improvement not only physical but mental. He is fully conscious of his responsibilities, but is reticent to the unfolding of his difficulties and anxieties. He certainly does not like to attribute his disturbed gastric function to his nervous system, although he often relates that during week-ends and other periods of relaxation his stomach is surprisingly silent.

The majority of my patients were under-weight. Table IX. shows that 60 per cent. were under 9 st. and 34 per cent. under 8 st. on their first appearance. It is difficult to assess and describe the various

TABLE IX
Weight of 240 Ulcer Patients

Stones ..	-7	-8	-9	-10	-11	-12	12
Gastric ulcer ..	28	27	21	14	14	1	—
Duodenal ,, ..	9	18	42	26	23	12	—
—	37	45	63	40	42	13	=240
	Total 145 (60 per cent.).			Total 95.			

influences which might possibly affect an individual, and a mental upset in one might be of little consequence in another. An attempt will be made to give an account of nervous influences more by example than by any general description.

NERVOUS UPSETS BEFORE THE DEVELOPMENT OF
DYSPEPSIA

I.—A man of 33, the father of six children, obtained work after a long period of unemployment. He was considerably upset three weeks later when he was forced to keep to his bed with influenza. In a few days he was well and he returned to work, but became greatly distressed to find that his post had been filled. Five days later he showed a perforated ulcer.

II.—A man, aged 53, who had always enjoyed excellent health, and who had been employed as chauffeur for many years, with the customary long hours of waiting, was favoured with a legacy on the death of his employer. He opened a small business and was soon troubled by financial anxiety. For the first time in his life he developed indigestion, and in ten days' time had a severe hæmatemesis. The presence of a peptic ulcer was subsequently verified by a barium meal. In this case the man had been accus-

tomed to security and served in a position somewhat free of hazard. Launching out into independence at 53 years of age resulted in mental anxiety and this was accompanied by the development of an ulcer.

III.—A woman of 49 had always enjoyed perfect health until she witnessed her daughter run over by a motor-car. Five days later she complained of indigestion. In a month's time a crater was visible in the duodenum.

IV.—A man of 48 suddenly lost, through death, two brothers who were partners in his firm. There was much financial worry in consequence and he began to suffer from severe indigestion. He was seen five weeks after the development of dyspepsia, and a large ulcer (Fig. 16) was discovered on the lesser curve. He had previously enjoyed excellent health.

NERVOUS UPSET AND RECURRENCES

During the last five years I have seen 45 recurrences, and doubtless this number will increase as the periods of observation extend. In 20 of these patients I have definite knowledge of some mental upset preceding the return of symptoms, and this is a sufficiently high proportion for us to seriously consider whether a deep emotional upset is not capable of producing a recurrent ulcer. Table X. shows the time of recurrence, and the nature of the upsets which preceded it, in the gastric and duodenal ulcer patients. Examples of the influence of mental upset in recurrence are the following:—

1.—A male, aged 45, was the manager of a failing business in 1931. The failure became a reality and he developed

TABLE X
Nervous Influences and Recurrent Ulcer
GASTRIC ULCER

Age.	Duration of treatment.	Date of recurrence.	Remarks.
30	12 mths.	16th mth.	Anxiety about work; put on half-pay; dyspepsia returned.
49	6 "	3rd yr.	Illness of daughter; tuberculosis.
		4th "		Business responsibilities; staff on holiday; sole charge.
61	6 "	6th mth.	Sudden illness and death of wife.
40	4 "	6th "	Legal proceedings pending; possibility of imprisonment.
26	6 "	6th "	Brother, hæmatemesis; much anxiety.
53	8 "	8th "	Daughter, sudden operation for hæmatemesis. Much anxiety.
34	9 "	9th "	Friend killed by car.
48	6 "	8th "	Daughter ill with puerperal sepsis.
		16th "		Pneumonia in member of family; much anxiety.

DUODENAL ULCER

62	6 mths.	6th mth.	Hyperchlorhydria; anxiety about balancing accounts at end of year.
54	12 "	3rd yr.	Hyperchlorhydria; acute business anxiety.
70	12 "	5th "	Distress from disseminating whooping-cough among grandchildren.
42	3 yrs.	5th "	Separated from wife; care of two children; legal case.
32	9 mths.	12th mth.	Sudden unemployment; wife pregnant. Five children; hæmatemesis 4 weeks after ceasing work.
31	18 "	18th "	Accident to husband at work. Dyspepsia returned 5 days later.
50	4 "	5th "	Son knocked down by car; much anxiety.
45	18 "	18th "	Notice to quit house; financial embarrassment.
42	3 yrs.	3rd yr.	Symptoms increased after death of husband. Responsibilities; mother of six.
41	3 "	2nd "	Following "influenza."
		3rd "	Saw friend killed by car; return of symptoms 3 days later.
40	Spasmodic.	5th "	Office worries preceding symptoms.
42	"	3rd mth.	Violent quarrel at home; profuse bleeding 3 days later.

indigestion. An ulcer was found on the lesser curve and treatment brought relief. He was well and working in a less responsible position until early in 1934, when his only child was diagnosed as suffering from pulmonary tuberculosis. This caused much upset and anxiety at home and his symptoms returned. A large ulcer crater was discovered and treatment again brought relief. The crater disappeared in six weeks and he gained weight from 9 st. 6 lb. to 10 st. 8 lb. during the following six months. Everything appeared well, and periodic radiological examination showed no return of the ulcer crater. However, in August this year he was again, owing to the holidays of other members of the staff, put in sole charge of a firm. Work was heavy and he was uncertain whether he could cope with it. Dyspepsia returned and a large crater became visible on the lesser curve of the stomach.

2.—Another patient, who had responded well to treatment, had in his sixth month the misfortune to lose his wife, after an operation. His grief was profound. Pain returned and an ulcer crater became again demonstrable and larger in size than on the initial examination. He died from a hæmatemesis in the seventh month. In this case there were undoubted signs of healing, but even with complete rest in bed and the strictest medical attention, the sudden grief was followed by a recurrence and a hæmatemesis closed the scene.

NERVOUS INFLUENCES IN POST-OPERATIVE RECURRENCES

Surgery does not of necessity confer an immunity against recurrences. Of the 15 patients who showed active ulceration some years after the initial operation for ulcer, 8 gave details which strongly suggest the important part played by nervous upsets. Table XI. gives the salient features, but two of the cases are worthy of more detailed record.

TABLE XI

Nervous Influences in Post-operative Recurrences Operation.—Gastro-enterostomy for duodenal ulcer

Age.	Date of op.	Present findings.	Remarks.
44	1927	1929. Recurrence of symptoms; medical treatment. 1932. Perf. jejunal ulcer. 1932. Partial gastrectomy. 1935. Recurrence of symptoms; ulcer crater lesser curve.	— — Four mths. dyspepsia on notice to leave work, held for 21 years.
47	1927	1935. Large ulcer, lesser curve.	Business worries; failure to negotiate sale of failing business.
58	1928	1934. Duod. ulcer crater and jejunal crater.	Wife ill, heart failure, much anxiety; hæmatemesis.
34	1927	1934. Jejunal ulcer.	Hæmatemesis on dissolution of partnership.
54	1929	1934. Lesser curve ulcer.	Death of wife. Four mths. dyspepsia.
30	1931	1935. Duod. crater.	Family quarrels.
40	1934	1935. Perf. jejunal ulcer.	Sudden illness of mother; return of dyspepsia.
43	1931	1934. Duod. deformity only.	Son in motor accident; return of symptoms.

A.—A male, aged 34, had a gastro-enterostomy performed for a perforated duodenal ulcer in 1927. In 1928 he suffered a mild recurrence of symptoms, but he enjoyed very good health afterwards until there was a sudden hæmatemesis in 1933. The anæmia was intense and his condition gave rise to much concern. In September of that year it was shown that he had a jejunal ulcer as well as an active duodenal ulcer. Treatment improved his general condition and in the early part of 1934 a barium meal demonstrated the disappearance of the jejunal crater; but one of the jejunal loops was found to be dilated and barium was held up in this loop for an appreciable time. A lateral anastomosis of the jejunal

loop was performed, and this operation gave an opportunity to verify the disappearance of the jejunal ulcer. A further barium meal a month after the operation showed the anastomosis between the two loops to be working well. The patient affirmed that he never had been fitter. He returned to work after a brief holiday and received what he termed the greatest shock of his life when the other partner in his firm said that a dissolution of partnership was imperative because he, the patient, had been



FIG. 16.—Large ulcer crater in a man of 48 with a five weeks' history.

away too much from business. Seven days later he had severe hæmatemesis.

B.—A man of 44, for whom a gastro-enterostomy for duodenal ulcer was done in 1927, enjoyed freedom for two years. A recurrence of symptoms was treated medically in 1929, and in 1932 a jejunal ulcer perforated after five days' dyspepsia. Six months later partial gastrectomy was performed. He enjoyed good health subsequently until 1935, when, following some episode of doubtful integrity, he was given notice to leave his work, where he had been in constant employment for twenty years. Much anxiety resulted as well as considerable disturbance in his domestic affairs. Within seven days indigestion returned and it continued for four months, when a barium meal examination showed that he had a large ulcer crater on the lesser curve of the remaining portion of his stomach.

IMPORTANCE OF THE NERVOUS FACTOR

There are undoubtedly many influences adverse to the healing of an ulcer. Coarse food, long hours without food, smoking to excess, violent muscular work, and especially fatigue from overwork, all play an important part and in all probability recurrences are often due to one or more of these factors. My own belief is that emotional upsets may also be powerful influences in producing a disturbed gastric function, and the incidence of such upsets in the recurrences of my series is especially high, even in those already subjected to operative interference, and in whom we could expect a ready regurgitation of alkaline juice into the stomach. Draper and Touraine⁴⁰ drew attention to the high familial incidence of ulcer, and suggested that there is a weakened or vulnerable alimentary tract which runs in families. Exposure to unusual anxieties or stress would perhaps be sufficient in susceptible individuals to develop an organic gastric lesion. I wish to emphasise that many of the examples which I quote were in persons who had already reached mature years; yet some change in environment or work

or increased responsibility or anxiety appears sufficient to produce alimentary symptoms never previously experienced.

Whatever view is taken of the influence of the nervous system on ulcer development, it certainly calls for a treatment which is wide enough to envisage the whole man and his environment. It becomes a general problem and not a local one. Furthermore, it becomes highly individual, and each case needs

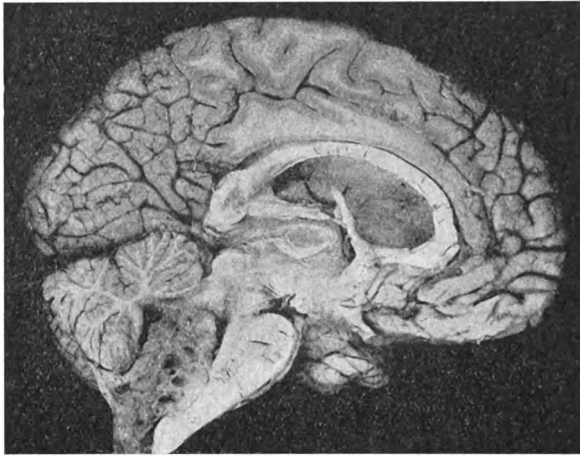


FIG. 17.—Tumour compressing medulla and producing internal hydrocephalus. Three hæmatemeses during twelve months before signs of increased intracranial pressure developed.

specific attention. Steering the patient through a mental crisis or possibly diminishing his responsibilities and thereby lessening stress and strain may do much in preventing a relapse. This close relationship between the organic peptic ulceration and nerve influence furnishes an explanation for the increasing incidence of ulcer in city dwellers. In spite of better food and better hygiene the condition is on the increase, and the greater stress and strain of living to-day can hardly be dismissed.

Organic Nervous Disease

Reference has already been made to the patient who showed a tumour compressing the medulla oblongata, and in whom a bleeding ulcer attracted attention six months before the development of nerve symptoms—an example of an organic nerve process situated in the line of the vagal tracts, a possible cause of the chronic ulcer. A similar case came to my notice in 1933.

A man of 37 had suffered vertigo for 13 months, associated with headache and a staggering gait. Three attacks of hæmatemesis occurred during this period, and two radiological examinations failed to reveal any ulcer. When he came under my notice there was bilateral papilloedema, and he died suddenly two hours after admission to hospital. A soft cystic and hæmorrhagic tumour was situated between the vermis of the cerebellum and the medulla, and there was considerable dilatation of the fourth ventricle, the medulla being much compressed. The tumour was an ependymoma.

This case is of interest in that three attacks of hæmatemesis occurred during the period when the patient's nerve symptoms were extremely mild, and a year elapsed before these symptoms became obvious enough to attract any serious attention. Here is, therefore, another example of an organic nerve lesion giving rise to gastric symptoms. Fig. 17 shows the tumour with the dilated ventricles.

Ambulatory Treatment

It is still held by some clinical observers that rest in bed is an essential part of the treatment of peptic ulcer, although Blackford and Bowers⁴¹ have published reasonably satisfactory results with ambulatory treatment. Hospital accommodation is limited, and during the past five years I have been forced to see what could be done in the way of ambulatory treatment. There is some advantage in this, in that the patient is encouraged to remain at his work. Of 351 gastric and duodenal ulcer patients, I admitted for medical treatment only 37. The period of observation does not extend beyond five years, and whatever claims I make on the treatment it must be at the same time emphasised that only 122 of my cases have been seen for more than three years (Table XII).

TABLE XII
Duration of Observations

	6 mths.	1 yr.	2 yrs.	3 yrs.	4 yrs.	5 yrs.
Gastric ulcer ..	22	32	25	31	19	12
Duodenal ..	14	80	46	32	21	7
—	36	112	71	63	40	19

Under treatment symptoms disappear extremely quickly, and as Goodall⁴² remarks, the "alkaline smile" is at once apparent. The patient gains in weight, and the ulcer, if it is a lesser-curve ulcer, can be seen to disappear, usually within 2-3 months. From Table XIII. it can be seen that 97 of 130

TABLE XIII
Results of Ambulant Treatment of Ulcer

GASTRIC		Cases.
Symptom-free and no radiological abnormality ..	76	97
" " but " confirmation ..	21	
" " but ulcer crater persisting ..	7	
Recurrence with no crater demonstrable ..	6	
" " return of crater ..	20	
		130
DUODENAL		Cases.
Symptom-free ..	128	
Recurrence of symptoms ..	25	
Persistence ..	10	
		163

gastric ulcers gave rise to no further symptoms, and 128 of 163 duodenal ulcers showed an equally good response. The total of known recurrences was 45 out of 293, but we can expect as time passes that the number of recurrences will be increased. However, the results reasonably justify ambulatory treatment. Even the recurrences do not show any increased difficulty in healing.

Two of the patients died of hæmorrhage while under treatment; one was a woman in her sixth month of treatment, the other a man in his seventh month. Four suffered from melæna during treatment, but the four recovered.

It is generally conceded that carcinoma develops on an ulcer in not more than 2-3 per cent. of cases. Two of my patients unfortunately died of cancer of the stomach, and in both the lesion was a lesser-curve ulcer; it was originally dispelled by medical measures, but a recurrence at a later date became carcinomatous. One case may be given in detail.

The patient, a woman of 41, gave a five years' history of indigestion. She had a large ulcer crater on the lesser curve of the stomach, which disappeared within six

months of treatment. There was immediate symptomatic relief and a gain in weight from 8 st. 4 lb. to 10 st. 6 lb. Gastric analysis showed hyperchlorhydria and a large volume of resting juice. In the sixteenth month the patient had a return of her symptoms. The ulcer crater again became visible, and on this occasion there was an adjoining area which failed to transmit peristalsis. Alkalis brought no relief and the patient lost weight. The hyperchlorhydria was replaced by hypochlorhydria and altered blood. Operation was advised, but unfortunately secondary deposits were present in the liver.

It is somewhat disturbing to realise that a lesser-curve ulcer can actually disappear, and the patient gain weight and relief from symptoms, and yet in so short a time there may be a recurrence ending in cancer. This should impel us to submit all patients treated for peptic ulcer to periodic X ray examinations, however benign the initial appearance of the ulcer.

One of my patients suffered from a perforated ulcer six months after receiving treatment for a duodenal ulcer, which had apparently healed. Unfortunately I know no more than this, nor of the history which preceded the perforation. Three others developed acute attacks of appendicitis during the first few months of medical treatment, and I cannot help wondering whether the alteration in diet, and the purgation sometimes caused by an alkaline powder, may not light up an appendix which is already in a state of chronic inflammation. The three did well.

It has often been stated that all septic foci should be eradicated as an essential part of medical treatment. There is really little experimental proof for this statement. For the past five years I have deliberately withheld any advice regarding attention to septic foci, and since relief from symptoms and healing of crater occurred in such a high proportion of the patients—most of whom came from the out-patient class among whom oral sepsis is certainly not uncommon—it is difficult to believe that sepsis plays any part in the initiation of a peptic ulcer.

Efficient treatment nowadays involves periodic radiological examination, and it is wise to continue its repetition until a restitution to normal is obtained. It is hardly fair to the patient, while such exact information is obtainable, to continue treating him without such knowledge. The change from hypersecretion to a more normal secretion is also an indication that he is on safer ground, while a persistent hypersecretion and hyperacidity should indicate the need for continued care.

The best therapy should include not only exact knowledge of local gastric affairs, but also the fullest knowledge of the patient. His active coöperation, so essential a feature of successful treatment, can only be realised when he is fully aware of the method of approach and its rationale. Moreover, the influence of his work, his anxieties and worries should be made known to him. Indeed, if a mental storm becomes inevitable, advice to buffer his acid juices all the more thoroughly with frequent feeds and alkalis may avert a catastrophe such as a perforation or bleeding. He should also realise that his stomach is his most vulnerable point, and the possibility of forestalling trouble would not be impossible.

The symptoms which precede ulcer development, and which are so amenable to treatment, should also be recognised. We are inconsistent if we diagnose the person with pain relieved by alkalis, who shows no local lesion, as a mere "functional dyspeptic," with all that this carries, and change our front at a later date when an ulcer has appeared to give the

patient all the care of an "organic lesion." The former is the precursor of the latter, and they deserve the same attention. Prevention of ulcer should be our aim, and to attain this our advice may perforce extend into fields far removed from gastric function.

General Conclusions

Although much is still obscure in the ætiology of peptic ulcer as seen in man, experimental surgery has shown that a chronic ulcer can be readily produced, and that active gastric juice is by itself sufficient to produce this lesion in the intestine. Experiment has also shown that there is a centre high up in the nervous system which, when stimulated, produces profound disturbance, both of motility and secretion, in the stomach, a centre which is undoubtedly influenced by higher levels. There is indeed close agreement on many points between clinical experience and these experimental findings. An attempt has been made in this study to show that a benign ulcer forms and heals rather readily, and that the hypersecretion and hyperchlorhydria—findings which are known to be more common in this condition than any other—do diminish and in time are replaced by a more normal gastric secretion. It has also been demonstrated that bodily rest is not essential for the healing of an ulcer crater, and that this healing occurs in some cases while the patient remains at his work.

The idea that peptic ulcer is a local manifestation of nervous disturbance in susceptible individuals is not new. Von Bergman wrote extensively on this hypothesis in 1914, and the further knowledge that has accumulated during the intervening years has supported this conception. The frequency of nervous bombardment in recurrence and in initiating symptoms is further evidence of the importance of these nervous influences. Efficient treatment must, therefore, be not only highly specific to the individual but also wide enough to encompass the whole man and his environment. As much prominence should be given to a consideration of his anxieties as to his diet.

With the advent and growth of pathology, during the latter part of last century, the profession felt confident in being able to distinguish between functional and organic disease. The line of demarcation was clear-cut. To-day we seem less certain of that demarcation, for the influence of mind over matter is recognised as a powerful force, capable not only of disturbing function but also of producing organic structural changes. Is peptic ulcer the end-result of such disturbance along nervous pathways, and should we not concentrate less on the lesion and more on the man and his surroundings?

May I tender my sincere thanks to my friends and colleagues at the Royal Free Hospital for their unflinching help, especially to Dr. D. Staveley and Dr. U. Shelley.

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**SKIN AFFECTIONS
UNDERLYING PRURITUS OF THE
VULVA AND ANUS**

A REVIEW OF THREE HUNDRED CASES

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THE diagnosis of a skin affection when it is localised on or around the external genitalia and anus may be, and often is, extraordinarily difficult, for the distinctive characters of the eruptions are wont to be modified in this moist warm area, and it is sometimes only by the discovery of typical lesions at other sites that the diagnosis can be made with confidence. The need for accurate diagnosis, and for the differentiation of the various skin affections which may give rise to vulval and anal irritation must be apparent, not merely for the purposes of treatment but also for the reassurance of the patient and for guidance in avoiding recurrences.

In Table I. the 300 cases on which this brief review is based are classified into seven groups.

TABLE I

Analysis of 300 Cases of Pruritus into Seven Groups

Cases.	Cases
I.—GENERAL SKIN AFFECTIONS :	V.—GENERAL CONSTITUTIONAL DISEASES :
Lichen planus .. 105	Diabetes .. 12
Seborrhœic dermatitis .. 69	Secondary anemia .. 2
Psoriasis .. 17	Disseminated sclerosis 1
Eczema .. 2	
Leucoderma .. 4	VI.—PSYCHIC .. 8
II.—DERMATITIS TRACMATICA ET VENENATA 59	VII.—VARIOUS :
III.—LOCAL CAUSES :	Lichenoid eruption with oral sepsis .. 2
Vaginal discharge .. 3	Lichenoid eruption with cholecystitis 1
Vaginal prolapse .. 2	Lichenoid eruption with malignant neoplasm of liver 1
Hæmorrhoids .. 2	Senile pruritus .. 2
IV.—PARASITES :	Imperfect hygiene .. 2
Scabies .. 2	Undetermined .. 3
Ringworm (Dhobie itch) .. 1	

The most striking feature of the Table is probably the large number of cases recorded as suffering from well-recognised skin affections, and in particular the excessive proportion of cases of lichen planus—an eruption which may affect skin and mucous membrane, and which is usually stated to occur rarely on the vulva.

LICHEN PLANUS

In a recent article¹ I have drawn attention to the similarity both in the clinical and histopathological findings between eruptions of lichen planus on the vulva and the condition commonly called leuco-

plakia vulvæ, which, it is stated, affects the skin of the vulva and of the adjacent parts. Many of the cases here classified as lichen planus of the vulva were referred with the diagnosis "leucoplakia vulvæ," and the existence of lichen lesions at other sites had not been observed.

The type of leucoplakia known as leucoplakia vulvæ, which it is stated affects ordinary skin, differs both in its clinical and histological findings, and must be carefully differentiated from the affection of mucous membrane known as leucoplakia buccalis, which occurs more commonly in men, and to which a sinister significance is attached owing to the records of cases in which malignant changes have been reported.

The importance of the observation that lichen planus of the vulva is indistinguishable both clinically and histologically from what is commonly described as leucoplakia vulvæ, lies in the fact that it is generally taught in the English text-books of gynaecology that leucoplakia vulvæ is a precancerous condition of the skin, and the serious operation of vulvectomy is advised for this condition, even in the absence of definite evidence of malignant change. Lichen planus is on the other hand definitely not a precancerous condition of the skin, so that the outlook for the patient must be widely different if a diagnosis of lichen planus rather than of leucoplakia vulvæ is established.

Confirmation of a diagnosis of lichen planus often requires the observation and consideration of lesions widely remote from one another, and in the cases here submitted a diagnosis of lichen planus of the vulva was made with extreme reserve unless typical lesions of lichen planus were evident at other sites. The search for lesions at different sites necessarily involves a general examination of the patient, and the study of these cases suggests a need for such an examination in every case where itching of the vulva and/or anus is the chief complaint.

The manifestations of lichen planus of the vulva are more fully discussed in the article to which reference has been made above.

SEBORRHŒIC DERMATITIS

The number of cases of seborrhœic dermatitis in the series is also high, and seems to indicate that seborrhœic dermatitis as a cause of vulval pruritus merits more consideration than is usually accorded to it. These cases included the youngest patients in whom vulval pruritus occurred, as might be expected, since the skin of the seborrhœic patient is peculiarly liable to develop eruptions from infancy upwards, and reacts to a great variety both of exogenous and endogenous causes by which the normal person is unaffected. Hence in such cases the general skin history needs investigation as well as the local condition, and it is to be remembered that the skin in these patients may be adversely affected by the usual anti-pruritic applications or even by such apparently innocuous causes as the bases of the ointments applied. Eruptions in seborrhœic patients are frequently associated with emotional crises, and it is not unusual to find subjective symptoms out of all proportion to objective signs, and as a result the condition in these patients is often extremely intractable.

The eruption is rarely limited to the genitalia. Seborrhœa of the scalp and trunk are usually present and lesions are common on the area covered by pubic hair. The eruption may be asymmetrical and one labium will be found thickened and erythematous, whilst the other is unaffected.

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PSORIASIS

Psoriasis as a cause of vulval pruritus is not common. In all the cases here recorded the eruption was of old standing and very limited in its distribution. The lesions were never found on the internal surfaces of the labia, and seldom presented the familiar silvery scales of psoriasis but tended to the exfoliative type. Symptoms were noticeably aggravated by any mental anxiety or disturbance. One case in which excessive subjective symptoms were a feature may be quoted. In this patient a coalescent band of psoriasis lesions was situated on the outer borders of the external surfaces of the labia majora and extended over the mons. Elsewhere only the nails were affected. This patient was the subject of excessive mental anxiety and worry, and vulvectomy had been suggested, on account of the persistent vulval irritation, on an analogy with the treatment advocated for leucoplakia vulvæ when the symptoms prove intractable.

The contrast between the number of cases of lichen planus of the vulva and psoriasis of the vulva in this series merits some comment, because the total number of cases of psoriasis and of lichen planus attending the hospital clinic is approximately the same, constituting about 12-13 per cent. of the total number of cases of every type of skin affection. Of these cases of every type the proportion with vulval symptoms is unusually high for a general hospital clinic, but may be accounted for by the fact that the hospital is entirely officered by women, to whom such cases would naturally gravitate.

ECZEMA

Eczema as is to be expected was a common diagnosis in cases referred to the clinic, but the two cases included under this heading seemed to me the only two in which a diagnosis of eczema could be made with assurance. Both patients were young married women with children; both had extensive weeping eruptions over the abdomen, genitals, and thighs; one had, in addition, an eczema of the hands, the second developed an eczematous rash on the arms and trunk following a slight excess of sweets. No trace of glycosuria was detected in this case at any time. The patient had undergone intensive treatment for months, including X rays, without relief until she was put on a mildly restricted carbohydrate diet, when the condition rapidly cleared and she has had no recurrence for two years.

LEUCODERMIA

The cases of leucoderma showed transient patches of de-pigmentation on the labia with a slightly inflammatory border to the lesions, and associated with intense irritation. No cause could be detected and no other skin lesion was observed.

DERMATITIS TRAUMATICA ET VENENATA

The cases grouped under the title dermatitis traumatica et venenata include all those in which the eruption was traced to injury inflicted by deleterious applications, and those others in which an individual hypersensitiveness to some particular external cause could be traced. In most of these cases both the anus and vulva were involved, as might be expected, since the usual history obtained was of a slight initial irritation of the vulva or the anus, which had become steadily worse and spread as the patient used one remedy after the other. In some the lower abdomen, buttocks, and thighs were the site of an acute inflammatory eruption; others

showed a white dry harsh skin inclined to fissure and similar to the conditions seen on the hands as the result of the excessive use of alkalis and antiseptics, whilst in others there was marked lichenification of the vulva and adjacent surfaces.

The cause of the initial irritation was often difficult to determine. Idiosyncrasy in some cases was the factor, as when the onset followed vaginal douches of iodine, or coincided with the use of a particular soap, or with an alteration in underclothing such as the adoption of dyed artificial silk undergarments or of the tight woollen garment known as "panties." A history of recurrent irritation at the menstrual period was not infrequent either as a result of the type of pad used or from inability to change frequently.

Where the irritation first arose around the anus, hæmorrhoids and constipation were a common finding, but hæmorrhoids per se will not cause an acute dermatitis of the vulva, nor on the other hand will a vaginal discharge or vaginal prolapse directly affect the skin of the anal area. The associated dermatitis in these cases is more commonly the result of frequent applications of different kinds which injure the skin.

Table II. shows the causes which were found to have contributed to the production of eruptions with persistent irritation in the cases under review.

TABLE II.—Causes

No.		No.	
I.—BATHS WITH :		IV.—OINTMENTS AND LOTIONS :	
Lysol	12	Germolene	8
Boric acid and carbonate of soda ..	6	Zambuk	1
Carbolic	2	Sulphur	2
II.—VAGINAL DOUCHES :		V.—APERIENTS :	
Strong potassium permanganate ..	4	Liquid paraffin ..	4
Iodine	2	Bile beans	3
Alum	1	Ex-lax	1
III.—PHYSICAL THERAPY :		Feen-a-Mint	1
Radium	1	VI.—SOAPS :	
X ray	1	Containing tar ..	4
Ultra-violet light ..	2	Synthetic scent ..	1
		VII.—UNDERCLOTHING :	
		Dyed artificial silk	2
		Wool	1

These figures suggest that an excess of cleanliness and the indiscriminate use of antiseptics, rather than the lack of personal hygiene, are potent causes of vulval and anal pruritus in women to-day, and it is perhaps significant of the changes in social conditions that no case of pubic lice was observed in a series of 300 cases of vulval and anal irritation in women, a majority of whom were seen in hospital clinics.

With regard to aperients the leakage of liquid paraffin around the anus is a fruitful cause of anal pruritus; bile beans is a secret remedy, and it is not therefore possible to explain why it should be the cause of anal irritation. Feen-a-Mint and Ex-lax both contain phenolphthalein, to which these patients were intolerant, and the eruption and irritation in these cases was not entirely restricted to the genital area.

GENERAL CONSTITUTIONAL DISEASE

Of the remaining groups the largest number of cases appear under general constitutional diseases. It is common knowledge that vulval pruritus may be associated with glycosuria, and routine examination of the urine is therefore essential.

The two patients with a secondary anæmia suffered from folliculitis, which cleared up with treatment of the general condition. The case of disseminated

sclerosis is of some interest because the patient had been given X ray treatment for the persistent irritation, though there was no evidence of any skin affection and the symptoms were probably the result of changes in the sensory nerves.

PSYCHIC

Eight cases only have been included in the psychic group though the existence of a psychic factor was recognised in many cases in addition to the definite causes which were found.

The patients included in this group showed no skin changes. One of the patients had become a syphilophobe after the discovery of her husband's infidelity. A second, a young married woman, was referred after she had been treated for months for acute recurrent vulval irritation and insomnia, and it was discovered that for a long time she had a child in hospital with bladder and kidney trouble. It was suggested to her that her thoughts were in consequence concentrated on her own genital area, and that she must cease thinking of it, and within two weeks her condition was relieved and did not recur.

METHYLENE DICHLORIDE INTOXICATION IN INDUSTRY

A REPORT OF TWO CASES

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Methylene dichloride (CH_2Cl_2) is a chlorinated hydrocarbon of relatively low flash-point, widely used in modern industry as a solvent for cellulose esters, fats, oils, resins, and rubber. It forms a large proportion of certain proprietary "paint removers," some of which are of German origin, and has also been used in the paint trade to raise the flash-point of lacquers.

It is an anæsthetic with a pleasant chloroform-like smell, slightly more toxic and irritant than chloroform. In commercial use it may be contaminated by the presence of methyl chloride (CH_3Cl): this sometimes might complicate the clinical picture. It was formerly used as a general anæsthetic by Richardson (1867); "10 fatal cases resulting from its use as an anæsthetic have been misquoted as due to its use in industry." "Otherwise no definite cases of poisoning have been reported," and Zernik¹ sums up the existing opinion concerning methylene dichloride when he says that "with good ventilation its industrial use is practically harmless."

In contrast, however, to this opinion may be set the practical experience of a manufacturer of lacquers who informs me that so far as possible he has abandoned the use of methylene dichloride "because of its ill-effects" upon the workers. "It dopes them, makes them stupid, they suffer from headache, are unreliable at their work and are awfully apt to tumble about and to hurt themselves." The same observer remarks upon the curious effect of this solvent and of other solvents upon the "psychology" of the workers. He says that "they are irritable, unhappy and require constant supervision if they are to be kept from making silly mistakes."

This shrewd observation, coupled with the effects of the drug upon the cases recorded below, raises a point of the utmost importance in industrial hygiene. Whilst it may be admitted—may even be proved—that many of these solvents do not (if pure) cause any

discoverable industrial disease, nevertheless they may detrimentally affect industrial health. As typical examples of this class of "physiological, non-disease-producing toxins" we may take methylene dichloride or trichlorethylene (which resembles it in very many of its pharmacological properties). It seems to me that this is a point of the first importance to industry. Workers who are constantly exposed to concentrations of these solvent gases may be rendered inefficient in their work without the production of discoverable pathological lesions.

These cases serve to illustrate another problem which always faces the industrial physician. That problem is the almost invariably "mixed" nature of industrial diseases (Alice Hamilton²). It will be observed that the first of the cases recorded below showed definite signs of chronic lead absorption, whilst the other suffered from a definite peptic ulcer and had recently fractured his skull. It is more than probable in fact that, but for these added disabilities, the connexion of methylene dichloride with the illness from which these workers suffered would never have come to the notice of any medical man.

THE CASES

Four painters were engaged during the autumn of 1935 in removing paint from the wall of a large room. A paint remover containing a high percentage (96 per cent. approx. by analysis) of methylene dichloride was used for this purpose. The windows were closed and rapid evaporation of the solvent took place. In this work the "remover" softens the old paint which is subsequently scraped off the wall by hand. All of the workers had been more or less exposed to lead absorption for periods varying from 5-14 years. They complained that whilst at work with the "paint remover" they became faint, giddy, and stupid, and stated that "this stupor passed off after a few hours," that they "felt better when not at work," and that "the stuff upset their appetite; that they did not care for food"; and that they felt dull and were not interested in things which had always interested them before. Of these four men, two were sufficiently ill to have to leave their work. They were examined by me at repeated intervals.

CASE 1.—A man, aged 42 (a painter for 13 years continuous), first seen on Oct. 12th, 1935. Peritonitis at 12 years of age. Five years' army service; double pneumonia and empyema at 32. Complaints: (a) irregular but severe pains in legs and arms, hot flushes, headache, vertigo, stupidity whilst at work with paint remover; could not read at night because his eyesight was not clear (? transient diplopia); anorexia; (b) precordial pain, rapid pulse, shortness of breath, great fatigue on exertion, and attacks of rapid beating of heart.

On examination soon after a day's exposure to the "remover," a faint "chloroform odour" could be detected in the breath. He was pale and nervous in manner, would flush up over the face and neck and then go pale again. Heart: apex-beat diffuse, outside nipple line. Pulse-rate 108 at rest. Arteries palpable, tenuous. B.P. 130/90. Respiratory system: old empyema wound on right side. No abnormal physical signs in chest. Urine normal. Alimentary system normal. Nervous system: no distinct abnormality. Special senses: no anæsthesia or alterations of sensation discovered. Romberg sign absent. No muscular weakness of hands or wrists. Fundi showed clear evidence of arterio-sclerosis of fundal vessels. Blood: red cells, 4,910,000; white cells, 6200. Normal differential count, but a punctate basophilia of the order of 3500 per million. Punctate granules large.

Course of illness.—Six weeks later the general condition was much improved and he had put on 1½ st. in weight; he still complained of precordial pain, but there was less dyspnoea. During this time the only change in his

circumstances were (a) the cessation of work with the methylene dichloride, and (b) the taking of half a pound of liver a day together with a mixture of ferri et quin. cit. He now looked much better and carried a better colour: pulse-rate 72 (at rest); apex-beat more distinct; heart still dilated; blood pressure 120/86. Blood picture normal, no punctate cells observed. The condition of the fundal vessels was unaltered. He was now quite "alert and clear in his mind." His eyesight was "better." Subsequent examinations at intervals up to the time of writing show that his condition now remains unaltered except for a slow improvement in his general condition.

The conclusions which I draw from this first case are (a) that the patient is suffering from the effects of slight chronic lead intoxication, which is shown by the state of his cardiovascular system, and (b) that he was suffering at the time of the first examination from the effects of acute toxæmia from methylene dichloride. The rapidity with which the acute symptoms subsided and the exact correspondence between his subjective complaints and those of the other workers is too clear to be explained by chance; the condition cannot be attributed (in my experience) to lead. The symptoms resemble also those presented by workers who are exposed to the vapour of trichlorethylene, and in a less extent to other industrial solvents of this non-disease-producing class.

CASE 2.—A man, aged 45, a painter for 20 years. Examined on Jan. 19th, 1935. Pneumonia at 38 years of age. Severe fracture of skull at 40. Irregular attacks of gastric pain and "black stools" since he was 33. Has had "gastric ulcer" on and off for last four years. Has used the same proprietary "paint remover" for two years; recently has used it much more extensively and used it indoors. This work makes him "drowsy, disinclined to do anything in evenings; makes him very irritable and easily disturbed by trifles." "Has pains in the head." He is highly intelligent. He finds that "he is better if he stays away from work." He has noticed "a definite tingling in hands and feet after working with this paint remover." Has now been away from work for two weeks.

On this evidence the patient was admitted to the General Hospital, Birmingham, under Dr. Stanley Barnes, for observation and the treatment of peptic ulcer. It does not appear necessary to detail his clinical condition which was that of a typical case of peptic ulcer, except to say that a congenital opaque patch was found in right disc. Central nervous system: normal. Urinary system: normal. Van den Bergh reaction: direct and indirect negative. Blood count: hæmoglobin, 100 per cent.; red cells, 5,320,000; white cells, 5500; no punctate basophilia; differential count normal. Wassermann reaction negative. Blood pressure 130/75. Pulse-rate 80. Heart and lungs normal. Alimentary system: "gastro-duodenal ulcer."

The condition rapidly improved on Hurst's diet, and he was discharged from hospital on Dec. 3rd, 1935.

The conclusions drawn from this case are that the patient had suffered from the effects of methylene dichloride intoxication on and off for two years until the condition of his alimentary system forced him to leave work. The methylene dichloride poisoning caused definite and characteristic symptoms which were relieved by the cessation of exposure and which are remarkably similar to those detailed above.

It did not prove possible to persuade the other workers to submit to examination, but I have definite information that they experienced exactly similar effects. As their general health was good, they did not leave work.

CONCLUSION

To sum up therefore, these cases suggest that methylene dichloride is a potential source of ill-health to those who are exposed to the fumes of it in any confined and unventilated space. Those effects are to be attributed to its anæsthetic action upon the

nervous system and are largely subjective—viz., headache, giddiness, stupor-irritability, numbness and tingling in the limbs, and possibly some degree of chronic anæmia. It seems to be important to emphasise that many of the industrial solvents (beside the chlorinated hydrocarbons) whilst they may not cause "occupational disease" may be real factors in the production of lowered efficiency, industrial fatigue, and definite psychological abnormalities of feeling and of conduct. It appears that this valuable industrial solvent (methylene dichloride) can safely be used in industry provided adequate ventilation is maintained.

I must gratefully acknowledge the help of Dr. Stanley Barnes, dean of the faculty of medicine in the university, and of Dr. Ethel Browning, of the Medical Research Council, who has put at my disposal much information and many references concerning the known effects of methylene dichloride. I must express also my thanks to Dr. J. A. Ainscow for permission to see the second patient and for his help in providing me with a remarkably detailed history.

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INTRASPINAL INJECTION OF ALCOHOL FOR INTRACTABLE PAIN

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IN operations for the relief of neuralgic pain it has been found that complete interruption of the nerve concerned is not necessary, but that partial destruction of the nerve-root has the same good effect. This led Dogliotti¹ in 1930 to attempt to damage the posterior nerve-roots within the spinal canal with alcohol in such a way that the conduction of pain would be arrested while little or no sensory loss would result. After demonstrating the practicability of the procedure by animal experiment he injected small quantities of absolute alcohol—0.2 to 0.8 c.cm.—into the cerebro-spinal fluid of patients suffering from painful diseases. As alcohol has a specific gravity less than that of the spinal fluid, he arranged the position of the patient in such a way that the nerve-roots he wished to affect lay at the highest point of the subarachnoid space as near as possible to the site of injection. For example, if he wished to affect the sacral nerve-roots, he made the injection into the lumbar theca while the sacral region was at a higher level than any other part of the spine or head. Dogliotti used his method in the treatment of conditions such as intractable sciatica and tabetic crises, and reported good results in a high proportion of the cases treated. Others, including Stern,⁵ Saltzstein,³ Yeomans,⁶ Greenhill and Schmitz² have used this method for the relief of the pain of malignant disease, particularly of the pelvic viscera, and have all reported many satisfactory results. During the past eighteen months I have used this method in attempting to relieve severe pain in 18 cases, and in several of these the result of the injection has been satisfactory.*

* Since this paper was written I have treated 4 further cases, in 3 of which the result was satisfactory. Good results following this method of treatment have also been reported again by Greenhill and Schmitz (*Amer. Jour. Obst. and Gyn.*, February, 1936, p. 290), who find it superior to pelvic sympathectomy in cases of carcinoma of the cervix; and by Abbot (*Amer. Jour. Surg.*, February, 1936, p. 351).

DANGERS OF THE INJECTION

It is in the first place necessary to emphasise the dangers of the injection. The most suitable cases for treatment are those in which the pain is referred to the lower part of the body. The injection is, therefore, made into the lumbar theca, and there is a danger of damaging the nervous control of the sphincters. Further, it should be noted that in many cases of pelvic cancer the bladder control is already interfered with by disease, and very slight damage to the nervous control may cause retention of urine. In one such case in the present series the injection of 0.8 c.cm. of absolute alcohol produced retention of urine. Sloane⁴ reports a case in which the injection of 1.0 c.cm. caused the same complication.

A second possible danger is that while the injection apparently causes no damage to the spinal cord at the time of the treatment, slight damage may occur which will cause a tendency to degenerative changes at a later date. In view of our ignorance of the ultimate effect of the injection it seems desirable at present to use the treatment only for advanced cases of inoperable malignant disease. This is the view held by most of those who have used this method, though Dogliotti originally injected many cases of non-malignant disease. It must, however, be noted that Dogliotti used small injections (0.2 to 0.8 c.cm.), and it is probable that injections of 0.4 c.cm. or less can be given safely in any case.

Most of the cases here reported have been of advanced malignant disease, and in some of these injections of as much as 1.5 c.cm. have had to be given in order to give relief from pain. In several cases this amount has been injected without any loss of sphincter control resulting, while in others a much smaller quantity has caused retention of urine. It is thus evident that the individual susceptibility to alcohol injections is very variable. The safest method, therefore, of giving the treatment is to start with a small dose of, say, 0.4 c.cm. of absolute alcohol, observe the effects, if any, during the ensuing ten days, and, if necessary, repeat the injection using a larger amount as is described later. If, in cases of advanced malignant disease of the pelvis, the bladder is drained by a suprapubic tube, and there is a colostomy, the danger of causing sphincter disturbance is removed and a larger injection can be given at first (0.8 c.cm.) without anxiety, provided the technique described is rigidly adhered to.

TECHNIQUE FOR THE RELIEF OF SACRAL PAIN

In order to relieve any pelvic or other pain conducted through the sacral nerves, the sacrum must form the highest part of the spinal canal during, and for a period following, the injection. Further, the side of the body in which most pain is felt must be uppermost. The patient lies in the usual position for lumbar puncture (Fig. 1), while the operating table is tilted or the foot of the bed is raised so that the sacrum forms the highest part of the spine; a pillow may be placed below the pelvis. It is important that the head should always be kept at a definitely lower level than the spine so as to avoid any risk of the alcohol running up into the skull while it is still in a concentrated state. For this injection I prefer to make the spinal puncture between the third and fourth lumbar vertebræ. A few cubic centimetres of spinal fluid are allowed to escape, and then 0.4 c.cm. of absolute alcohol is slowly injected, the whole amount being introduced during

a period of about 20 seconds. Cerebro-spinal fluid should *not* be drawn into the syringe prior to injection. The needle is then withdrawn, but the patient is made to lie in the same position for about an hour. He must on no account raise his head or the upper part of his body. He may, however, with advantage, turn slightly on his face as soon as the injection is completed so that the alcohol may have access more to the posterior than to the anterior nerve-roots. After lying in the same position for an hour, the patient is treated as after an ordinary lumbar puncture. Headache followed the injection in only one of my cases.

During the injection the patient often experiences a burning sensation referred to that part of the body supplied by the nerve-roots that are being damaged by the alcohol. Where the sacral roots are being treated numbness is often noticed in the buttock and foot of the side that is uppermost. Some sensory loss may be demonstrated in the sacral and lower lumbar distribution, and the ankle-jerk is often diminished or abolished.

The degree of sensory loss should be tested shortly after the injection, for this demonstrates not only which nerve-roots have been damaged, but also the degree of damage caused. As has already been mentioned, the susceptibility of the nerve-roots varies from case to case. Within a few hours the slight sensory loss and reflex disturbance usually disappear entirely. In some cases the pain disappears at once. In some it remains unchanged for several days and then ceases, perhaps ten days after the injection. In some it becomes less, but is not abolished. If the pain is still severe ten days after the injection, the operation may be repeated. If the previous injection caused no sphincter difficulty and little sensory disturbance, 0.6 to 0.8 c.cm. of alcohol may be safely injected. As before, the side to which most pain is referred should be uppermost, but if the pain is central, as in the case of bladder and rectal pain, the second injection should be made with the patient lying on the side opposite to that on which he was placed for the first injection. The effect is again observed for a period of ten days, and if pain is still severe, and if there has been no sphincter difficulty, and little or no permanent sensory loss, a still larger injection may be given of 1.0 to 1.3 c.cm. of absolute alcohol. Additional or larger injections are seldom required. After the treatment distension of the bladder should always be looked for and promptly relieved by catheterisation. In most cases in which sphincter difficulty occurs, the difficulty passes off in a few days. The injection for the relief of sacral pain is often effective in relieving the distressing bladder and rectal spasms which occur in malignant disease involving these organs. At the same time, the hæmorrhage and discharge which accompanies these spasms become much less. If the pain persists in spite of these injections, the case should be reconsidered from the point of view of the exact situation of the pain. The above method will only relieve pain conducted via the sacral nerves, and will therefore not relieve pain felt in the front of the thigh or leg, or in the lower abdomen, which is conducted by the lumbar and lower dorsal roots respectively.

METHOD OF RELIEVING LUMBAR OR THORACIC PAIN

When severe pain is referred to a part of the lower extremity supplied by the lumbar nerves, the position of the patient for the injection should be such that the upper lumbar vertebræ form the highest part

of the spine (Fig. 2). The injection may be made between the second and third lumbar vertebrae. The procedure is otherwise the same as described above.

When the pain is referred to the abdomen or chest, the injection is not so easy to carry out. The patient is placed so that the nerve-roots conducting the pain are situated at the highest part of the spine (Fig. 3). The spinal theca is punctured at this level, care being taken to penetrate the theca the least necessary distance, so as to avoid risk of injury to the spinal cord.

Dogliotti described a method of injecting alcohol to affect the cervical nerve-roots, but as I have no experience of this I shall not refer to it further.

FURTHER POINTS REGARDING TECHNIQUE

When the larger injections are being made, it is wise to stop for a few seconds after a part of the injection has been given to test for the presence of gross sensory loss or weakness. Such an observation will give the operator some indication of the sensitivity to alcohol of the nerve-roots in the case he is treating.

Some patients with advanced malignant disease are in an emotional and highly nervous state. In such cases I usually give morphine and hyoscine before the injection, the amount depending on the tolerance already developed for the opiates.

RESULTS OF THE TREATMENT

In the following short abstracts of the cases treated it will be noted that the injections given were in many instances larger than those advised. The first injections I gave were small (0.5 c.cm.) but had no effect in relieving severe pain, hence in advanced cancer cases I have given injections of 1.0 c.cm. or more. As however in one recent case this amount has caused retention of urine, I am again reducing the amount of the initial injection. It should be clearly understood that most of the cases treated have been advanced cases of malignant disease, most

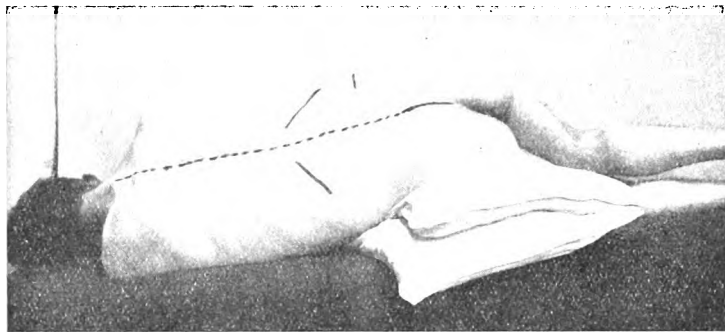


FIG. 1.—Position of the patient for injection when the pain is conducted through the sacral roots of the right side.

of which were in the cancer wards of a hospital for incurables.

CASE 1.—A man, aged 72, suffered from carcinoma of the prostate for which the bladder had been drained by a suprapubic tube. He had suffered severe spasms of pain in the bladder for over two years with almost continual hæmorrhage from the bladder. Two alcoholic injections were made, one of 0.5 c.cm. and a second of 1.4 c.cm. in November, 1934. Considerable relief of pain persisted to death on Jan. 20th, 1935. A striking effect of the injection was the cessation of hæmorrhage from the bladder.

CASE 2.—A woman, aged 77, suffered from carcinoma of the rectum which caused much rectal pain. 1.0 c.cm. of alcohol was injected on Nov. 19th, 1934. No sensory loss or reflex disturbance could be demonstrated on the day

following. Complete relief of rectal pain persisted to death on June 4th, 1935.

CASE 3.—A woman, aged 50, suffered from a huge tumour of the sacrum and a pathological fracture of the femur. 0.6 c.cm. of absolute alcohol was injected in November, 1934, but no relief of pain resulted. The injection was carried out with great difficulty owing to œdema of the back and patient declined to have a further injection.

CASE 4.—A man, aged 60, was seen on Feb. 28th, 1935, suffering from severe pain referred to the front of both thighs which had been gradually getting worse for a period of seven weeks. The pain was very severe on coughing and was aggravated by lying down, so much so, that he had been unable to go to bed at night for some weeks. Great œdema of both legs had developed. On examination there was no motor, sensory, or reflex abnormality. X ray examination showed some abnormality of the tenth dorsal vertebra, which was thought to be due to malignant disease. The patient was rapidly becoming exhausted with the severe pain and required large doses of morphine to give relief. On Feb. 28th 0.5 c.cm. of absolute alcohol was injected with the patient lying on his right side. The cerebro-spinal fluid was yellow and contained 400 mg. of protein per 100 c.cm. The examination of the cerebro-spinal fluid showed no other abnormality except that the colloidal gold curve was

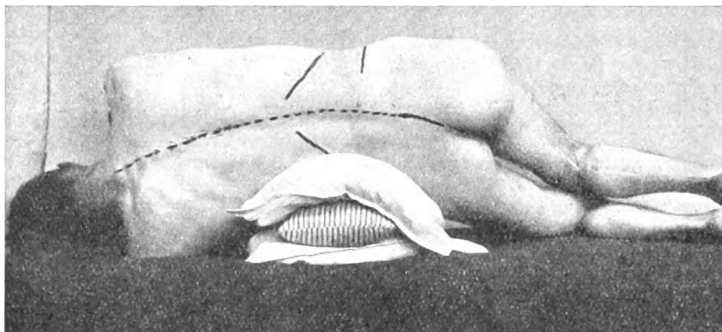


FIG. 2.—Position of the patient for injection when the pain is conducted through the lumbar roots of the right side.

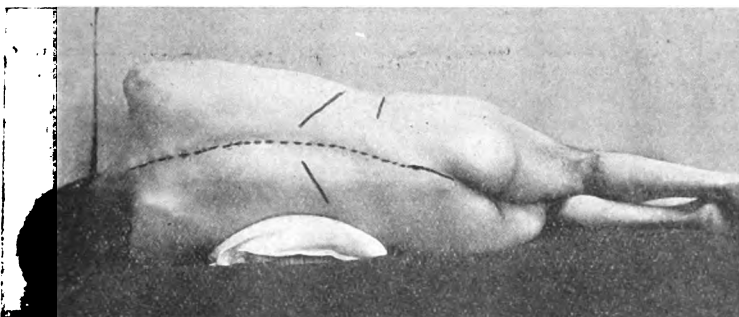


FIG. 3.—Position of the patient for injection when the pain is conducted through the lower dorsal roots of the right side.

333322210000. No relief of pain resulted, and on March 1st 1.3 c.cm. of absolute alcohol was injected with the patient lying on his left side. On the day following there was some difficulty with micturition which subsequently passed off. There was also transient weakness of the right leg and some sensory loss in the sacral distribution. For two days after the second injection the pain remained severe; thereafter, it quickly disappeared and in June, 1935, the patient returned to full work as a sea-captain. When examined on Jan. 18th, 1936, seven months later, he was still perfectly well, free of all pain and able to do full work. The only effect of the injection was slight numbness in the fifth lumbar and first sacral distribution on the right side. X ray examination of the spine showed no conclusive evidence of disease. There had been no further difficulty in passing water and the area of sensory loss was becoming steadily less. The diagnosis in this case remains undetermined.

CASE 5.—This patient, a man of 65, suffers from carcinoma of the rectum. Colostomy was performed in May, 1934, and suprapubic drainage of the bladder instituted in December, 1934. Owing to severe perineal pain 1.0 c.cm. of alcohol was injected in March, 1935. Pain was relieved for two months, after which a further injection of 1.3 c.cm. was given to affect the opposite sacral roots. Slight sacral sensory loss and absence of the ankle-jerk persisted for a few days. Pain was almost entirely relieved and the patient's general condition improved greatly. In November, 1935, he was able to walk half a mile. Thereafter some discomfort returned owing to the progressive reduction of bladder capacity.

CASE 6.—A woman, aged 59, suffered from carcinoma of the uterus which was causing great pain. On March 3rd, 1935, 1.5 c.cm. of absolute alcohol was injected. Transient weakness and sensory loss in one leg resulted. No sensory loss persisted, but pain was relieved till death on May 7th.

CASE 7.—A man, aged 62, suffered from advanced carcinoma of the rectum for which a colostomy had been performed. Severe root pains had been referred to the left thigh for many months causing great restlessness and for which large doses of opium were required. Injection of 1.5 c.cm. of absolute alcohol on April 19th, 1935, abolished the reflexes in the left leg, but caused little motor or sensory loss. No further opium was required and the patient was free of severe pain till he died on May 3rd.

CASE 8.—A woman, aged 53, had a huge sarcoma involving the sacrum and lower lumbar vertebrae. She suffered very severe pain on movement and had been obliged to lie on her face for three months. On May 25th, 1935, with the patient lying on the right side, 2.0 c.cm. of alcohol was slowly injected above the first lumbar vertebra, the lower intervertebral spaces being invaded by tumour. Little pain was felt on the day following and the patient was able to be nursed on her back free of severe pain till she died on July 5th. No retention of urine occurred and little motor or sensory loss resulted.

CASE 9.—A man, aged 66, suffered from severe pain due to rectal carcinoma for which colostomy had been performed. 1.5 c.cm. of absolute alcohol was injected on June 29th, 1935. Some weakness of the uppermost leg occurred with loss of knee- and ankle-jerks and sensory loss below the third lumbar supply. Pain was relieved but death occurred from gastric haemorrhage on July 2nd.

CASE 10.—A man, aged 77, suffered from cancer of the pelvic organs for which a colostomy had been performed. 1.5 c.cm. of absolute alcohol was injected on July 13th, 1935, to damage the left sacral nerve-roots; but no sensory loss, weakness, or reflex disturbance resulted. Great relief of pain persisted till death on July 18th.

CASE 11.—A woman, aged 58, suffered from carcinoma of the rectum for which colostomy was performed in September, 1934. Rectal pain had been becoming steadily more severe and was hardly bearable. On July 29th, 1935, 1.3 c.cm. was injected to damage the left sacral nerve-roots. As some pain persisted the injection was repeated ten days later; on this occasion the right side was uppermost and 1.5 c.cm. of absolute alcohol was injected.

Some weakness and sensory loss occurred after both injections, but pain was entirely relieved and there was no loss of urinary control. The slight weakness did not prevent her from walking without difficulty. The patient left hospital and returned home on Sept. 5th.

CASE 12.—A man, aged 65, suffering from carcinoma of the prostate and severe root pains in the left thigh. On August 11th, 1935, 1.4 c.cm. of alcohol was injected with the left leg uppermost. Considerable sensory loss in the left sacral distribution and complete retention of urine resulted. Severe pain persisted in the second lumbar distribution, but the patient declined to have a further injection.

CASE 13.—A man, aged 66, suffered from advanced carcinoma of the rectum for which colostomy was performed in June, 1935. Recently some urinary difficulty had been noticed. On Sept. 14th 1.0 c.cm. of alcohol was injected. The knee- and ankle-jerk on one side were abolished, but some pain in the rectum continued and the patient complained of a numb feeling of the leg. Further injections were not carried out in view of the urinary difficulty.

CASE 14.—A man, aged 60, suffered from advanced malignant disease of the left lung. There was severe pain referred to the scapula and to the lower part of the abdomen on the left side. On Sept. 26th, 1935, after the administration of morphine and hyoscine to enable the patient to lie comfortably, he was placed on his right side in such position that the sixth dorsal vertebra formed the highest point of the spine. The subarachnoid space was tapped between the seventh and eighth dorsal vertebrae and 0.6 c.cm. of absolute alcohol was slowly injected. This relieved the pain in the left scapula but severe pain continued in the left side of the abdomen. A further injection was given ten days later of 1.0 c.cm. with the eighth dorsal vertebra forming the highest point of the spine. This, however, failed to relieve the severe pain and further injections were not attempted.

CASE 15.—A woman, aged 75, had been incapacitated for the past year with severe arthritis of the knees. On Nov. 30th, 1935, 0.5 c.cm. of absolute alcohol was injected into the subarachnoid space between the third and fourth lumbar vertebrae, with patient lying on her right side and the third lumbar vertebra forming the highest point of the spine. No sensory loss was demonstrated following the injection and the reflexes were unaltered. Some relief of pain in the left knee resulted.

CASE 16.—A woman, aged 48, suffered from an advanced stage of disseminated sclerosis with extreme contracture of the right leg and considerable flexion deformity of the left leg. Flexion spasms of the legs were frequent and caused great pain. On Dec. 20th, 1935, 0.5 c.cm. of absolute alcohol was injected into the subarachnoid space between the second and third lumbar vertebrae, the patient lying on the right side and the third lumbar vertebra forming the highest point of the spine. Almost immediately the clonus of the left ankle and knee was abolished and the spasm at the left knee became much less. The left knee-jerk was abolished. Considerable sensory loss occurred from the second to fifth lumbar distribution of the left leg, the sacral segments escaping entirely. On Jan. 20th, 1936, considerable pain continued in the extremities, but flexion spasms of the left leg no longer occurred. The knee-jerk was still absent and the ankle-jerk was sluggish. The injection had not increased the patient's slight difficulty with micturition.

CASE 17.—A woman, aged 47, suffered severe perineal pain from carcinoma of the vagina which involved the rectum. 1.0 c.cm. of absolute alcohol was injected. Transient sensory loss occurred in the S1 to S5 distribution of one leg. Severe pain was relieved, but the patient remained very uncomfortable and slight incontinence of urine followed the injection.

CASE 18.—A man, aged 68, suffered from carcinoma of the rectum for which a colostomy had been performed. Severe spasms of rectal pain with haemorrhage caused great distress. 0.8 c.cm. of absolute alcohol, injected on Dec. 26th, 1935, to damage the left sacral roots, caused

some temporary sensory loss in the left sacral distribution and loss of the left ankle-jerk. Complete relief of rectal pain resulted, but retention of urine occurred. The rectal discharges ceased.

SUMMARY

1. The intraspinal injection of alcohol is a dangerous procedure unless carried out with great care and strict attention to the details of the technique advised.

2. The injection often relieves the severe pain of malignant disease.

3. Eighteen cases which have been treated by this method are briefly described.

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TREATMENT OF ANKYLOSTOMIASIS IN INDIAN SEAMEN

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WHILE examining the stools of Indian seamen after treatment for ankylostomiasis, it was noted that although ova-free stools were finally obtained the worms were often never recovered in the faeces. Therefore a small series of investigations were carried out during the years 1930-34 on such patients admitted to the Albert Dock Hospital under the medical charge of Dr. Low and Dr. Manson-Bahr to discover whether recovery from ankylostomiasis could take place without the worms ever being found in the stools after treatment.

All the cases in this series were Indian seamen employed in ships running between London, India, Africa, and the Far East. In each case the number of ankylostome ova per c.cm. of faeces was obtained by the Clayton Lane direct centrifugal floatation method before treatment to obtain an idea of the degree of infection. After treatment each stool passed was examined by the same method and the number of ankylostome ova per c.cm. was noted. Where necessary the treatment was repeated until ova-free faeces were obtained on at least seven consecutive days. After the seventh day if ova-free faeces were obtained, the patients were discharged from hospital to go back to their work on the ships. Between 5 and 12 months later, when the men returned to London, specimens of faeces were obtained from them and examined, as before, for ankylostome ova. The men were treated with various anthelmintics and the Tables illustrate the work done and the results obtained.

Although the patients returned on their ships to tropical countries it is fairly safe to assume that they were not reinfected with ankylostomiasis during their short stay on shore. A number of interesting points may be noted:—

1. In the stools recovered immediately after treatment small fragments of what were thought to be disintegrated worms were found in about 25 per cent. of all cases examined. It is thought that the majority

of these natives contract ankylostomiasis during childhood and that the worms become firmly embedded in the convolutions of the wall of the small intestine. Anthelmintic treatment by the combined method seems to be the most efficacious way of killing these worms, but it does not remove them intact.

TABLE I

A.—THYMOL

Case No.	Ova per c.cm. before treatment.	Presence of ova in direct faecal film.	Treatments.	Days before faeces became ova-free.	Worms passed.	Ova per c.cm. of faeces 5-12 months later.
1	40	—	2	10	—	—
2	37	—	1	6	—	—
3	87	—	2	11	—	26
4	56	—	1	6	—	—
5	62	—	1	6	—	46
6	26	—	1	5	—	—
7	46	—	1	6	—	—
8	118	+	2	12	7	—

B.—OIL OF CHENOPODIUM

1	32	—	1	5	—	—
2	72	+	2	12	3	26
3	66	—	2	11	—	—
4	41	—	1	6	—	—
5	8	—	1	7	—	—
6	34	—	1	6	—	56

C.—CARBON TETRACHLORIDE

1	62	—	1	5	—	—
2	45	—	1	3	—	34
3	89	+	1	5	7	—
4	24	—	1	4	—	—
5	26	—	1	5	—	—
6	124	+	3	14	12	52

D.—COMBINED TREATMENT; CARBON TETRACHLORIDE AND OIL OF CHENOPODIUM

1	32	—	1	4	—	—
2	64	—	1	5	—	—
3	76	—	1	5	—	—
4	54	—	1	5	—	—
5	42	—	1	4	—	—
6	53	—	1	5	—	—
7	83	+	1	5	—	—
8	82	+	1	5	—	—
9	135	+	1	6	9	—
10	25	—	1	5	—	—
11	47	—	1	4	—	—
12	43	—	1	4	—	—
13	82	+	1	5	2	—
14	21	—	1	5	—	—
15	47	—	1	4	—	—
16	56	+	1	5	—	—
17	34	—	1	5	—	—

TABLE II.—Summary of Results

Table I.	Treatment.	Men treated.	Men in whom worms were recovered after treatment.	Men relapsing after 5-12 months.
A.	Thymol.	8	1	2
B.	Oil of chenopodium.	6	1	2
C.	Carbon tetrachloride.	6	2	2
D.	Combined treatment.	17	2	0

2. Faecal films, prepared by the ordinary coverslip-saline method, of stools containing ankylostome ova do not reveal the eggs as a rule unless the ova content is greater than 60 per c.cm. The Clayton Lane method is undoubtedly the best for detecting ankylostome ova in faeces.

3. The technique of administering the combined treatment is conveniently carried out as follows: (a) starve the patient from midnight; (b) at 9 A.M.

give carbon tetrachloride M 40 in two gelatin capsules and oil of chenopodium M 15 in two gelatin capsules, followed by magnesium sulphate 1 oz. in a tumblerful of water. Natives usually experience no trouble in taking the treatment, but about one in ten are sick after carbon tetrachloride; aspirin, grs. 10, relieves this. Stools are passed at the rate of about three during the first 24 hours, two during the second 24 hours, after which defæcation becomes normal.

4. Although not recorded here, some of the men included in this series were also suffering from *Ascaris lumbricoides*, *Trichuris trichiura*, and *Oxyuris vermicularis* infections. The combined treatment seemed to be satisfactory for these helminths also.

I am much indebted to Dr. Carmichael Low and Dr. Manson-Bahr, under whose direction the work was carried out, and to Dr. H. M. Hanschell for kindly providing laboratory facilities to undertake this work.

TECHNIQUE OF INTRAVENOUS ANÆSTHESIA

BY RONALD JARMAN, D.S.C., M.R.C.S. Eng., D.A.
AND

A. LAWRENCE ABEL, M.S. Lond., F.R.C.S. Eng.

THIS note describes the methods we use for injecting intravenous anæsthetics such as Evipan and Pentothal. As we have lately pointed out,¹ these can be given in one of three ways: as a single dose; in repeated doses; and by continuous intravenous infusion.

1. *Single dose.*—The sterilised syringe having been loaded, a dental prop or Hewer's mouthpiece is inserted between the patient's teeth. The upper part of the arm is constricted, either manually or by a pressure armlet, and the needle inserted into an antecubital vein. Assuming a dose of 10 c.cm., the first 2 or 3 c.cm. of the solution is injected in about 15 seconds, during which time the patient is asked to count. He usually becomes unconscious in 15-30 seconds, and a pause is then advisable, for about the same period, so that one may be satisfied that his condition is within normal limits. If the injection is given too rapidly, the pulse-rate rises and the respirations become depressed. The next 3 or 4 c.cm. should be injected in about 30 seconds. After a further short pause, provided the patient's condition is satisfactory, the remainder of the 10 c.cm. dose is given at the previous rate. Both the pulse and respiratory rates are constantly observed, a clear airway is maintained, and the jaw is supported throughout the anæsthesia.

2. *Repeated doses.*—If a further dose is likely to be wanted the needle may be left in the vein, and the syringe removed, re-charged, and

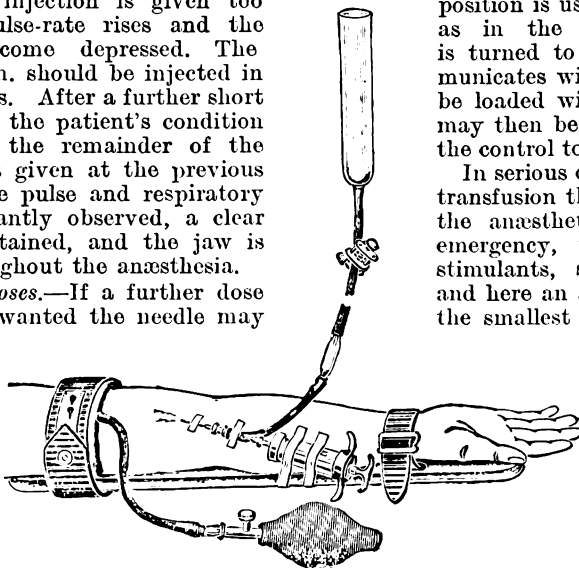


FIG. 1.—Dickson Wright's apparatus.

replaced if required. For this purpose Dickson Wright's splint,² which controls the forearm, will be found convenient. This has an upper band consisting of a pneumatic bag which can be inflated and deflated by means of a bulb with a release valve attached and a lower

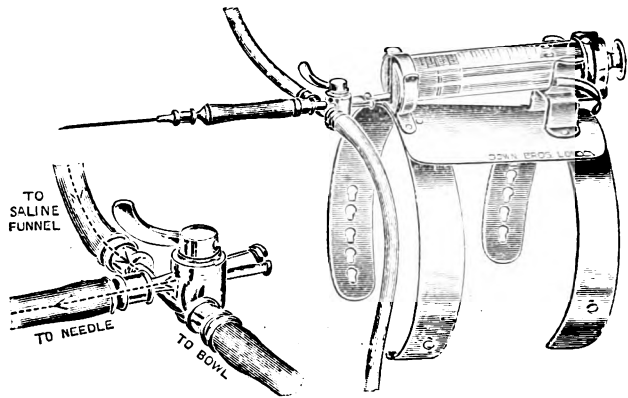


FIG. 2.—Authors' three-way syringe.

band firmly gripping the wrist. The needle and syringe are fixed to the forearm and kept in place by means of adhesive plaster.

3. *Continuous intravenous infusion.*—Two forms of apparatus are available for this:—

(a) An ordinary intravenous apparatus is used to convey normal saline with 5 per cent. glucose from a flask container to a vein. The lotion need not be heated. A dripper, controlled by a simple thumbscrew, is adjusted to deliver not less than 20, and not more than 30, drops a minute. The limb is with advantage controlled on a suitable splint. The needle, attached to the syringe containing the intravenous anæsthetic, is inserted into the tubing near the vein and the injection given as into the vein (Fig. 1).

(b) The authors' three-way syringe (Fig. 2). A 10 c.cm. syringe with a three-way nozzle is fixed to the forearm with elastic bracelets. With the control in the central position, the barrel of the syringe communicates directly via the needle to the vein. When the control is turned to the left, the lateral feed communicates directly with the needle, and this position is used for continuous saline-glucose infusion as in the preceding method. When the control is turned to the right, the other lateral feed communicates with the barrel, and the syringe can thus be loaded with a further dose of anæsthetic, which may then be injected through the needle by turning the control to the mid-position.

In serious cases a patient can, of course, have blood transfusion throughout the operation with pauses for the anæsthetic administration. Similarly, for any emergency, the syringe can be used for giving stimulants, such as Coramine or Alpha-lobeline; and here an advantage of the apparatus is that only the smallest amount necessary of the drug need be given, since it is accurately measured and reaches the vein direct. We have found the administration of continuous saline-glucose infusion during operation of the utmost importance in some of the "poor risk" cases. Dehydration is combated all the time and shock is largely abolished.

¹ See Jarman and Abel: Intravenous Anæsthesia with Pentothal Sodium, THE LANCET, Feb. 22nd, 1936, p. 432.

² Wright, A. D.: Technique of Evipan Anæsthesia, *Ibid.*, 1935, 1., 1040.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF SURGERY

At a meeting of this section held on March 4th the chair was taken by Mr. W. SAMPSON HANDLEY, the president, and a discussion on

Intestinal Strangulation

was opened by Mr. IAN AIRD. The mortality of operation for this condition, he said, had fallen to about 40 per cent. by the end of last century and had continued there ever since. The principles of operative treatment could be stated simply: the cause must be removed and non-viable bowel excised. The only question was where lay the dividing line between viable and non-viable bowel. Certain experimental data threw doubt on the wisdom of returning to the abdomen sections of bowel which regained their circulation when the strangulation was released. Gross venous congestion marked the dividing line. While release after a short period improved the circulation, sudden release of a congestion long maintained had a depressor effect on blood pressure. This had been shown by experiments in dogs and cats, which Mr. Aird described. In one case the fall of blood pressure had been followed by death in eight minutes; in others there had been fall of blood pressure after congestion lasting from 6 to 18 hours. Shorter periods of congestion produced a rise in blood pressure when the congestion was suddenly released.

The causes of death in strangulation were three: perforation and peritonitis, loss of blood from the circulation, and absorption of toxic elements from the strangulated bowel. If the loop strangulated were short, the treatment was that of peritonitis; if it were very long, blood transfusion was indicated to replace the blood lost in the loop. In the average medium-length loop another factor must be sought, and the general treatment must be directed towards the toxæmia. Loss of blood in these cases was an important but not a lethal factor. The transudate from the strangulated bowel contained, as a result of bacterial growth in the bowel wall, two toxins. The first was a euglobulin, perhaps related to the complex bacterial toxins; this was the only toxic protein fraction. The non-protein element was a diffusible substance, perhaps histamine, which was present in surprisingly high concentration.

Artificially strangulated loops of small intestine taken from new-born guinea-pigs in which the intestine was sterile could be placed in the peritoneal cavities of adult cats without harm. This strongly suggested that the toxicity of strangulated loops depended on bacterial action. Another series of experiments had shown that the transudate fluid was non-toxic and the seromuscular coat was sterile when the strangulation was only a few hours old. After 18 or 20 hours aerobic and anaerobic bacteria invaded the bowel wall and the transudate became toxic. Animals injected with the euglobulin showed spasticity before death and affection of the liver and spleen post mortem. Certain bacterial exotoxins had the composition of a euglobulin. The success of *B. welchii* preparations in intestinal strangulation had never been explained. The new specific antisera ought to have a field of usefulness in this condition. Death from the non-protein substance was in every case preceded by respiratory embarrassment.

Work on the histamine content of transudate was still in progress. Transudate protein-free filtrate caused an almost identical excitatory effect on guinea-pig ileum to that produced by histamine. The inhibition of rat and stimulation of guinea-pig uterus were similarly comparable. The concentration seemed to be between 1/10,000 and 1/20,000. Proteolytic organisms were present in the bowel wall in enormous quantities and the conditions were ideal for histamine production. Vagopressor substances therefore seemed indicated in treatment.

Dr. DAVID SLOME described experiments by Mr. G. C. Knight and himself. The fluid-loss factor in long-loop strangulations had been determined by weight comparisons. It had varied from 1.4 to 2.2 per cent. of body-weight and so was insufficient to account for death. The initial fall in blood pressure could be attributed to the fluid loss, but the failure to recover and gradual decline leading to death must be attributed to some other factor. Cross-connexion experiments in two animals had shown that strangulation lowered blood pressure, although the fluid loss was all sustained by the other animal. In the non-viable type of strangulation the animals were all dead within 48 hours. The survival-time was definitely related to the severity of the strangulation, but there was no constant relationship between survival-time and amount of fluid loss. In no case was the volume of fluid lost adequate to account for the death. Peritoneal fluid from non-viable loops had been shown to be toxic by transplantation. The toxin by itself produced collapse and death in a normal animal and the blood pressure was always depressed. In viable loops there was no evidence of a toxic fluid at 24 hours. In severe strangulation it might be present after one hour. The depressor substance was readily dialysable through a semi-permeable membrane. The toxin seemed to be formed in the wall of the gut and rapidly passed into the venous blood and into the lumen of the bowel. The rapidity of its formation in high concentration was against a bacterial origin. The depressor action could be demonstrated in thoracic duct fluid also if the lymphatics were not occluded. Relief of venous obstruction allowing return of blood to the circulation did not improve the animal's condition but set free more depressor substance. The substance might be identical with the depressor principle found in normal urine. The urine of cats with strangulated intestine had proved to be depressor.

Mr. G. C. KNIGHT emphasised the significance of the experiments described by Dr. Slome. The toxæmia in strangulation was characterised by early onset and its cause was probably a mixture of depressor substances. Bacterial action only contributed in later stages if at all. Death occurred in the presence of almost normal blood chlorides. Fluid loss was only an accessory. The severity of the strangulation was directly related to the survival period. The length of loop played a part, but not to an extent justifying classification of cases according to length. The parts played by renal function, saline therapy, and the release of the depressor substance into the circulation all required consideration. Attention should perhaps be focused more on the viability of the patient than of the gut. Experiments suggested that death occurred within 96 hours if simple release were practised, while the animals remained alive and well after excision of quite viable loops. Clinical cases had shown similar results.

DISCUSSION

Mr. R. St. L. BROCKMAN pointed out that there was a toxæmia of intestinal obstruction whether the strangulation were severe or not. If the circulation were completely obstructed so that the loop died instantly, no toxic substance was formed in that loop. In the upper part of the intestine isolated loops were toxic; in the ileum they could safely be left. The upper part was more sterile, so bacteria could have little to do with it. Cells in the bowel above a strangulation were living in their own exudates which could not be passed on. As this process mounted the bowel it stopped the action of the glands in the upper part—the liver and pancreas. Patients often died a few days after an operation for relief. In dogs the fatal change had taken place at the moment of stoppage of biliary flow. When the stoppage reached the duodenum life stopped too. There might be in the duodenum some production of vital ferments necessary for the life of the whole organism.

Mr. R. L. HOLT said that the results reported confirmed his own work. He agreed that there were two distinct toxic factors. One appeared within the first hour and was very similar to histamine. It could also be obtained by strangulating omentum and might be the result of tissue breakdown following anoxæmia. After about 20 hours a second protein-toxic factor appeared at the same time as the gut content changed to a black fœtid toxic fluid. The length ordinarily strangulated in a hernia would not produce enough toxin to have a wide general effect; the clinical effect of obstruction was very important. There was also dehydration from vomiting and distension above the strangulation. The amount of fluid withheld from circulation was a most important factor. Long-loop strangulation showed a special clinical picture associated with acute shock and pallor; the combination of toxic absorption and fluid loss were enough to kill the patient. Every loop about which there was the slightest doubt should be resected, and if the patient was in a bad state exteriorisation was a good measure.

Mr. TURNER WARWICK said that complete ligation, in cats had not produced symptoms of obstruction apart from perforation. High obstruction might depend on chemical changes below it as well as above it. The constricted part of the bowel had not received the attention it deserved. A Canadian worker had shown that animals died of toxæmia even if the loop were washed quite free from bacteria. Animals did not die if the distended coil were denervated—which suggested shock as the cause of death.

SECTION OF ORTHOPÆDICS

At a meeting of this section held on March 3rd, under the presidency of Mr. C. MAX PAGE, a discussion on

Fractures in the Region of the Shoulder-joint

was opened by Mr. GEORGE PERKINS, with the remark that it was well occasionally to examine accepted principles of treatment to see how far practice was in accord with theory. The conception that a fracture was a dual injury was not a new one. In past years there had been some who concentrated on treatment of soft parts in fracture cases and appeared almost to forget about the bone. Many had treated the bone and forgotten the soft parts. If there now existed, as he thought there did, a modern school of thought concerning the treatment of fractures, that

school emphasised one fact: that a fracture was a dual injury, and that both bone and soft parts required treatment; that treatment of those parts was of equal importance and should be undertaken simultaneously. Taking the three stages of treatment, (1) reduction, (2) splintage until the bones moved as one piece, (3) protection until consolidation, it was agreed that nothing could be done for the soft parts in stage (1), but in stage (2) the masseuse standing at some distance from the patient made him (a) move all the free joints through their full range; (b) contact all his muscles over the immobilised joint; (c) use his limb, this last being the most important. Thus when stage (3) was reached there was little for the masseuse to do—i.e., she simply had to make the patient move all the joints to their full range, with perhaps a little massage if it was mentally satisfying to the patient. When the bone repair was completed, repair of soft parts also was almost complete. There remained, in the aftermath stage, an occasional manipulation under gas anæsthesia to assist the complete range of movement.

As to the relative importance of treating bone and soft parts, it was granted that bony union was essential, and in cases in which it was difficult to bring about that union the bone treatment was paramount. In fracture of the scaphoid, for instance, it might be necessary to immobilise the wrist-joint for six months in order to bring about the necessary union. But where there was difficulty in restoring mobility to a joint, treatment of soft parts might be the more important. Shoulder and knee had in common the quality that when immobilised, even for a short time, they stiffened; that happened even when there had been no injury or inflammation round the joint, but it was more pronounced in the presence of injury. Some might say this applied to the shoulder-joint only if the arm was held immobilised close to the side, but with that he did not agree. In any fracture about the shoulder-joint, the treatment of soft parts was of far greater importance than the treatment of bone, even allowing that the bone needed treatment. But did the bone need treatment? Injury of bone was divisible into three phases: (1) reduction, (2) splintage until union occurred, (3) protection until consolidation took place. Anatomical reposition of fragments was rarely possible and rarely necessary. The surgeon was content with "good reduction," meaning that when union was completed the alignment of the bone would give rise to no loss of function. In fractures round the shoulder-joint, reduction rarely had to be attempted, often indeed the fractured surfaces were already in good reduction. In the cases in which reduction should be attempted, he considered it could not be done without an open operation. The kind of case needing this was where the shaft of the bone was in front of the head, and the fractured surface was jagged.

Splints were used for two distinct reasons, sometimes for both: (1) to hold the fractured ends still and so prevent them from moving on one another; (2) to hold the fractured ends in good position. If there were muscles inserted into both fragments, they were sufficient to keep the fractured ends still. If no muscle was attached to one or both, splintage was necessary. And sometimes the muscles attached to both fragments could not prevent all movement. But in the shoulder-joint a plexus of muscles was inserted in the neighbourhood of the fracture, and they sufficed, he thought, to hold the fractured ends still. To hold the ends in good position the two essentials were a longitudinal pull to reduce overlap and an upward pull to prevent backward sag. Unless

plaster-of-Paris was used, a splint would not prevent the fractured ends from moving on one another. Where a fracture lay between two hinged joints, as at the knee or ankle, good alignment was essential; but if it was between ball-and-socket joint and hinge joint, mal-alignment was of little moment, because the plane of the ball-and-socket joint would accommodate itself to the plane of the hinge joint. The shoulder was a ball-and-socket joint. Most fractures would unite, whether treated with a splint or without. His contention was that fracture about the shoulder-joint should never be splinted, because (1) reduction was often unnecessary, and if necessary it was usually impossible; (2) the muscles sufficed for holding the fragments immobile; (3) mal-union was of minor importance; (4) treatment of the soft parts was of more importance than treatment of the bone. The bugbear was a stiff and painful shoulder. A patient with a fracture round about the shoulder should be given a sling, and treatment by a masseuse should be commenced at once, preferably in the recumbent position. The patient should move the muscles round the joint, and, as soon as he could be induced to do so, move the joint itself. If unwillingness was shown, he should be taken into hospital or nursing-home and the massage intensified.

Mr. R. WATSON JONES (Liverpool) said that during childhood and adolescence the shoulder was seldom injured. For the purpose of this discussion he had investigated every case of shoulder injury treated in his fracture clinic at Liverpool Royal Infirmary during five years—over 700 cases; he would speak mainly, however, of the 571 cases of dislocation of the upper end of the humerus. Of the 216 shoulder dislocations, only 6 were under 20 years of age. Radiograms clearly differentiated two types of isolated fracture of the great tuberosity. One was a result of direct contusion of the bone; the fragment split off from the end was frequently comminuted and never widely displaced. In the other type the displaced fragment was small, involving only the part of the tuberosity into which the supraspinatus tendon was inserted. It represented the first stage of avulsion of that tendon. If the fragment was not displaced, the functional result was excellent. But if the supraspinatus was completely torn away, the resulting disability might be serious. Dislocations of the shoulder-joint and dislocations with fracture of the great tuberosity should be grouped together, as they were clinically similar. A very different injury was dislocation of the shoulder with fracture of the neck of the humerus. Early forced passive movement was just as disastrous in shoulder dislocations as it was in elbow dislocations. Myositis ossificans was often seen in badly treated dislocations of the shoulder. When the great tuberosity had been torn off, the fragment of bone was usually large; it was found to have been completely reduced when the dislocation was reduced. Avulsion of the supraspinatus was of great importance and it could not be diagnosed until after mobilisation was begun. It was then found that active abduction was recovering more slowly than passive abduction; if the deltoid was seen to be contracting normally the diagnosis was then clear. It was essential to support the arm in a frame with 90° of abduction until active movement was restored. Dislocations and fracture-dislocations of the shoulder were often complicated by nerve lesions; in this series 1 in 7. They were usually traction injuries. An analysis showed that the circumflex nerve was most commonly involved, next in frequency the posterior cord of the plexus and the musculo-spiral. Usually the lesion was a

physiological block, not a complete nerve severance; it was not surprising that nearly every such case recovered after expectant treatment.

It had been customary, said Mr. Watson Jones, to divide fractures of the neck of the humerus into fractures of the anatomical neck and fractures of the surgical neck, but this he regarded as of no value. One natural group was that of fractures produced by a direct blow on the point of the shoulder—i.e., a crack fracture of the neck of the humerus, as a rule, subperiosteal and without displacement, and usually associated with a comminuted fracture of the tuberosity. Treatment and prognosis here were the same as in fractures of the great tuberosity without displacement. Another group was the adduction fracture, the arm being carried inwards. In the elderly patient the adduction fracture should be left impacted, active movement being begun at once; in younger patients the fracture should be manipulated and treated in an abduction frame. A third group was the abduction fracture, with inward angulation, the great tuberosity as a rule being fractured and pinched off. In some cases the tuberosity might not be completely detached, the head being rotated far out. In such a case, after reduction of the fracture, the surgeon might be forced to immobilise the limb in the abducted externally rotated position. If that was done, traction was essential in order to prevent the shaft from sliding back again under the head. Turning to fracture-dislocation, the impacted type could not possibly, he said, be reduced by manipulation. If it was to be reduced at all it must be operated upon, the head disimpacted from the shaft, and the tuberosity replaced. After the Nicola operation, if the proximal fragment bearing the articular cartilage was completely deprived of blood-supply, aseptic necrosis might cause arthritis and ankylosis of the joint. In the unimpacted fracture-dislocation it was well to attempt manipulative reduction. In a dock labourer, aged 42, this treatment had restored him to his heavy work with normal range of movement in all directions. Where aseptic necrosis had caused degenerative arthritis without ankylosis it was advisable to perform arthrodesis. In a doctor, after freshening of the surfaces, he drove a bone-graft through the head of the bone into the glenoid, and the patient still remained an expert boxer. In conclusion, Mr. Watson Jones said that the neck of the humerus was a common site for secondary neoplasms, and pathological fractures were sometimes mistaken for simple ones.

DISCUSSION

Mr. C. H. FRANKAU did not agree with Mr. Perkins that fractures of the neck of the humerus with displacement required operation. His practice had been to keep such cases immobilised for six days, simply bandaging the arms to the sides, and afterwards starting active movements and gentle massage.

Mr. H. A. T. FAIRBANK was glad that both openers had emphasised the drawbacks of abducting most of these fractures. He had often seen cases in which abduction had worsened the condition of the fracture. His own practice was to abduct the arm a little by a pad in the axilla. He had been impressed by the fact that displacement of the great tuberosity was unimportant.

Mr. A. S. BLUNDELL BANKART said that for many years he had been treating fractures of the neck of the humerus in old people by immediate active movements; this had given practically complete mobility of the joint.

Mr. N. L. CAPENER said that sometimes fracture of the greater tuberosity led to supraspinatus strain; this muscle was apt to contract, and, lying so deeply as it did, the effect was difficult to counteract. The result was some limitation of horizontal flexion, with inability to get the arm across the shoulder. The patient should be required to practise touching the opposite shoulder.

Mr. ALAN TODD said the abduction treatment was useful in some cases. The cardinal principle to apply to most fractures in the region of the shoulder was to place the greater fragment which was controllable in line with the lesser fragment which was uncontrollable. If to abduct the greater fragment would cause obvious mal-alignment, then abduction was out of place.

REPLY

Mr. WATSON JONES thought it was possible to be too enthusiastic in mobilisation of shoulder fractures on the first day. Where there was displacement mobilisation should wait for two or three weeks. Torn tissues which were moved too much would repair with a greater amount of scar tissue. Mobilisation of fingers, wrist, and elbow should start at once. The stiffest shoulder was found in the patient with stiff fingers.

Mr. PERKINS remarked that movement should be begun as soon as possible. In fractures around the shoulder-joint it was better to forget the bone and treat the injury as if it was a bruise.

SECTION OF THERAPEUTICS AND PHARMACOLOGY

At a meeting of this section held on March 10th, with Dr. DOROTHY HARE, the president, in the chair, a discussion on the

Treatment of Addison's Disease with Salt

was opened by Dr. GEORGE GRAHAM. In outlining the development of this treatment, he said that Loeb in 1932 had made a complete analysis of the base and acid radicles of the blood in Addison's disease, and shown that there was an escape of sodium, and with it of chlorine, from the blood when the adrenals were removed. Since that time Addison's disease had been treated with salt. It was as if there were a leak through which sodium escaped from the body. It could be controlled by giving cortical extract or by adding more sodium to the reservoir. Patients immediately showed improvement when salt was given to them, and sometimes they could give up their extract altogether or reduce the dose. Dr. Graham then described five cases treated at St. Bartholomew's Hospital in the last two years. One had died in a few days without investigation. Two others had gone out of hospital much improved after salt treatment and had then died within a few days of contracting a febrile illness. It was important to keep in touch with these patients and to make those in charge of them realise that when they contracted feverish illnesses their dose of salt or cortex must be increased, just as the diabetic needed special care in such circumstances. One patient, a man of 34, had had typical Addison's disease with much pigmentation, a blood pressure of 80/50, and a blood sodium of just under 300 mg. per 100 c.c.m., and had been vomiting excessively, very weak, and quite unable to sit up. After a single dose of salt he had felt very much better and had sat up and read the paper.

Dr. S. LEVY SIMPSON pointed out that the high cost, the weak concentration, and the necessity for injections constituted serious disadvantages to cortical treatment. Salt treatment was based on sound experimental and biochemical work and had been received with enthusiasm. Experience had, however, revealed its limitations. He described six cases of Addison's disease which illustrated the value and limitations of salt therapy, and drew the following conclusions: (1) salt by mouth might be of real value in the acute, subacute, and chronic phases of Addison's disease; (2) salt might be of no apparent value or the benefit might be so slight as not to be appreciated by the patient; (3) the emetic action of the chloride might prevent the oral administration, but sometimes salts of sodium other than the chloride might be satisfactorily substituted to overcome this difficulty; (4) 10 g. of salt daily was as much as most patients could possibly take, but sometimes 20 g. or more were necessary; (5) cortical extract in adequate dosage by itself or in addition to salt therapy gave a much better clinical response than salt alone; (6) when the dose of cortical extract was adequate the addition of salt was of no benefit—this was in keeping with work on adrenalectomised animals; when, however, the dose of cortical extract was inadequate, the addition of salt might help appreciably; (7) when patients had gone into a crisis in spite of having large doses of salt, the administration of cortical extract had produced recovery; (8) it was possible to get signs and symptoms of adrenal insufficiency although the serum level of sodium, chloride, and potassium appeared to be within normal limits. These conclusions were in keeping with experimental evidence. The cortical hormone was now known to regulate the balance of sodium chloride and other minerals. Cortical extract aided the sodium leakage by repairing and stopping the leak, but administration of salt was nothing but a frantic effort to keep pace with the abnormal loss. The control of leakage by cortical extract could only be a question of dosage, but the large doses necessary for more severe cases rendered the use of extract difficult and sometimes impracticable. No one could be satisfied with the concentration of the extract at present available, but with the crystallisation of the essential element there would, Dr. Simpson believed, be no other treatment for Addison's disease.

Dr. E. N. ALLOTT described eight cases which he had seen from the beginning of their treatment. Some cases had normal blood-urea readings; a normal blood-urea was not incompatible with Addison's disease. He submitted charts showing the effect of treatment on the urea, the potassium, the sodium, and the chlorine in the blood. One patient who was having a huge dose of cortical extract, up to 60 c.c.m. a day, had shown a reduction of the blood potassium only when salt was added to the cortical treatment. His sodium and chlorine figures had never reached normal. During a crisis there was a fall in the sodium and chloride and a marked rise in the potassium. Curiously, the urea had fallen in the crises he had investigated. Dr. Allott concluded from his study of the chemical changes in the blood that the syndrome of low sodium and chlorine and high potassium was found in all cases, and that treatment with salt alone did not in all cases restore the blood picture to normal and keep it so. Cortical extract seemed to affect the potassium and urea much more than the sodium and the chlorine. Sometimes there was evidence of blood dilution as revealed by a fall in the serum protein and haemoglobin. Two interesting

cases had been admitted to hospital for quite different conditions. In both of them adrenal insufficiency had been diagnosed by blood chemistry and confirmed by post-mortem examination. One was a woman who had suffered from very severe vomiting which had been regarded as hysterical and not taken seriously until her systolic blood pressure had been found to be 70. She was almost moribund on admission to hospital, although she showed no pigmentation, and had died before any treatment could be instituted. At autopsy her suprarenals had been found to be quite atrophic. The second patient had been diagnosed as cancer of the stomach and had shown the typical blood picture. The only pigmentation he had shown had been a patch over the spine of each scapula. An important point for diagnosis was that in Addison's disease the fall was much more a fall in sodium than in chlorine, whereas in uræmia the fall was more marked on the chloride side than on the sodium side. The typical blood picture was not found in other conditions such as lung abscess, cancer, and hæmochromatosis.

Dr. GRAHAM observed that the really important thing was to obtain a cheap cortical extract. If it were not so expensive at present, no one would think of using salt.

The Vitamin B₁ Content of Human Diet

Dr. AUDREY BAKER read a paper by herself and Dr. Margaret Wright on an estimate of the amount of vitamin B₁ provided in certain standard diets. Cowgill, she said, had made the first estimate of this vitamin by determining the minimum amounts necessary for dogs, pigeons, rats, and mice. He had devised a formula relating the amount to the body-weight and the calorie intake:

$$\frac{\text{Vit}_1}{\text{Cal}_1} = \frac{3.27}{115,000} \cdot W_1$$

It was nowadays possible to make an assay of food-stuffs against the international standard unit, and to get an idea, not only of the beri-beri threshold, but also of the intake necessary for the maintenance of good health. Dr. Baker first of all considered a number of diets which were known to have been associated with outbreaks of beri-beri. When the amount of vitamin B₁ in these diets was worked out, it was found to vary from 71 international units to 382. Over 4000 cases of beri-beri had occurred in a few months in Bilibid prison, Manila, and the diet contained only 71 international units per person per day. The diet in the prison had been improved to 163 units but beri-beri, although reduced, had not been entirely stamped out. On a diet containing 122 units in Java prisons there had been some cases of beri-beri. In an Irish asylum 106 per 1000 of the patients had contracted the disease although their diet contained 438 units; it was, however, thought that the patients had not eaten all that was provided for them. There had been a thousand cases of beri-beri in the Dutch East Indian navy on a diet containing 90 to 180 units; when this was improved so that it contained 253 units it had protected natives but not Europeans. It was clear that no one specific intake protected all individuals; the vitamin allowance must be related to the weight and calorie intake. A diet which would protect from beri-beri might contain anything from 145 to 500 international units per person per day according to the weight and diet.

It was interesting to see what allowance of vitamin B₁ was obtained on various diets which had

been published. Barborcka's skeleton diet had 343 units per person per day. The B.M.A. specimen bare ration gave 212 units on a basis of 3460 calories, but the committee stated that they thought that this diet was deficient in vitamins. The B.M.A. individual diet No. 2, described as typical for the working-man with adequate income and sufficient in vitamins and minerals, yielded 440 units for 3060 calories. Barborcka's typical diet included "cooked cereal" and, according to the cereal selected, gave from 463 to 743 units.

The question of children's needs was a more difficult one. Judging from published diets, a higher level of B₁ was desirable. The B.M.A. diet for a child from 3 to 6 gave 298 units for 2089 calories. Sample diets by Simmonds gave from 376 to 393 for children of this age and from 606 to 657 units for a child of 11. The Ministry of Health's advisory committee on nutrition, in its report on Poor Law children's homes, gave a 2749-calorie diet which yielded 450 units of B₁ per child.

Diets which were definitely stated to be high in vitamin contents gave larger figures. Barborcka's high vitamin diet represented 872 to 1012 units and Simmonds's from 693 units upwards, while the highest of all was that recommended by Theobald for pregnancy toxæmia: 1520 units. Experimental animals showed clearly that more B₁ was needed in pregnancy: three to five times as much as the normal. There was therefore a wide difference between the protective level and a really high vitamin diet. In the intermediate zone the B₁ content of a mixed diet depended on an informed selection of foodstuffs. Such factors in the rejection of food as dislike, indigestibility, economy, or difficulty of preparation might reduce the content below the level of the physiological requirements for health.

ROYAL MEDICAL BENEVOLENT FUND.—The hundredth annual general meeting of the Fund will be held on Tuesday, March 24th, at 5 P.M., at 11, Chandos-street, London, W., when Sir Thomas Barlow, F.R.S., the president, will take the chair.

At a recent meeting of the committee 13 new applicants were helped and 29 grants were renewed. In all £1029 was voted. The following are particulars of a few cases helped.

A. B., aged 77. Retired from practice in 1925. Is now suffering from arthritis and severe sciatica and finds walking difficult. His savings are exhausted and he is living with his married son whose means are only £2 a week. The Fund voted an emergency grant of £5 and a maintenance grant of £40, payable in four instalments.

Widow, aged 36, of M.B. who died last year leaving her and their two children penniless. The widow is to take up training in chiropody and the Fund voted a maintenance grant of £36, payable in four instalments. The Ladies' Guild will help in the educational expenses of the children.

C. D., aged 79, has outlived his savings and finds it extremely difficult to get posts as locum tenens. Fund voted £40, payable in four instalments.

Daughter of doctor, aged 63. Suffering from tuberculous mesenteric glands. Lives in Switzerland for the sake of her health. A grant of £26 was voted by the Fund towards her medical expenses.

The son of a deceased medical practitioner aged 88, who was in receipt of a Fund's annuity till his death this year, writes:

"May I take this opportunity, once more, of thanking the committee for the manner in which my father's annuity from the Fund was administered. It was very largely instrumental in making his closing years comfortable and peaceful."

As this is the centenary year of the Fund a special appeal is being made for new subscribers to carry on the work begun a hundred years ago. Since then over £398,000 has been distributed in charitable allowances. Cheques should be sent to the hon. treasurer of the Fund, 11, Chandos-street, London, W.1.

MEDICAL SOCIETY OF LONDON

At a meeting of this society on March 9th the chair was taken by Sir THOMAS DUNHILL and a paper on

Phlebitis and its Treatment

was read by Mr. A. DICKSON WRIGHT. The terms thrombosis and phlebitis were virtually synonymous, he said, since the former was almost an inevitable result of the latter, while some amount of reactionary phlebitis always accompanied thrombosis. There seemed to be no one special organism or cause associated with phlebitis, and organisms had never been convincingly cultivated from the vein. On the continent there had been an endeavour to class phlebitis as a metabolic disease, caused by cholesterol and treated with light-hearted endocrine cocktail mixtures, often combined with the rather fantastic ritual of Bagnolles spa. Since 99 per cent. of phlebitis was in the legs the one common ætiological factor seemed to be stasis.

Certain forms of phlebitis could be regarded as parts of definite primary disease syndromes. Essential thrombophilia was a rare disease of great gravity with a tendency to affect the arteries as well as the veins. Thrombophlebitis migrans was a febrile disease of long duration occurring in the extremities of persons with low blood pressure. It was not dangerous or disabling and rarely extensive, for only small vessels were involved. When focal sepsis had been removed the patient should go away to a healthy bracing place and not be kept in bed. Ephedrine should be given to raise the blood pressure and enough thyroid to produce a mild toxicosis. Nevertheless every disease had its malignant forms, and in this condition the kidneys might become infarcted and pleuropneumonia might develop. Traumatic phlebitis was the result of injury to superficial veins. It might occur in the axillary and subclavian veins as the result of carrying weights or of injuries through downward snatching. Prognosis in these cases was poor if the cephalic vein could not empty into a patent subclavian vein. If there was associated brachial paralysis the inflamed vein should be dissected out from the nerve bundle. Phlebitis was a usual protective process in the neighbourhood of suppuration but if the clots themselves suppurated the condition became serious. This might be seen in the jugular vein in mastoid disease, the superior mesenteric vein in appendicitis, and the facial veins in carbuncle of the lip. A few cases had followed the injection of contaminated solutions into varicose veins. Proximal ligation was satisfactory and was sometimes combined with evacuation of the suppurating clot. Buerger's disease was an affection of the superficial veins of the leg and eventually of the deep veins also. In time the arteries might show an affection. Mesenteric thrombosis was often due to venous rather than arterial thrombosis and tended to occur in portal obstruction and after removal of the spleen. Familial phlebitis might take any form and post-operative thrombosis and embolism also ran in families.

SECONDARY PHLEBITIS

The vast majority of cases belonged to the secondary group and might follow a medical, obstetrical, or surgical illness. All prolonged prostrating illness was apt to be complicated by phlebitis—e.g., typhoid, pneumonia, influenza, and malaria, in that order of frequency. Rheumatic and typhoid fevers were the only cause of juvenile femoral thrombosis. Coronary

thrombosis was often followed and occasionally preceded by a femoral thrombosis and this condition might also be seen in pregnancy when thrombosis of normal and varicose veins was quite common. The largest number of all forms of secondary phlebitis, however, came under the heading of puerperal. The term phlegmasia alba dolens should be reserved for femoral thrombosis. A solution of this complaint was still awaited. Of the surgical causes, post-operative cases provided the bulk and appendicitis headed the list. Other operations of evil effect were cholecystectomy, hysterectomy, prostatectomy, and gastric procedures. Certain countries had a bad reputation for this disease and operations on the leg veins had a high incidence; no doubt the tourniquet was a fruitful cause. Fractures of the legs and pelvis also produced thrombosis.

Phlebitis in the legs could be classified as superficial and deep vein thrombosis. The latter was the more serious and its appearance was a catastrophe in any case. It was contributed to by changes in the blood—e.g., increased coagulability, increase in blood-platelets, increased viscosity from dehydration, and increased sedimentation-rate; and by retardation of the blood flow due to the position of the patient, increase of abdominal tension or restriction of the respiratory movements. Nothing could be done to return the blood to normal and the injection of anticoagulants was rather disappointing. Much, however, could be done to remove retardation of flow. The Fowler position was bad; it should be maintained with a foot-rest and not a knee pillow and dispensed with as soon as possible. It caused stasis in the veins and the lower limbs. Tight bandaging and meteorism restricted the venous return and peritoneal pain or rigidity of the chest wall restricted respiratory movements. Deep breathing exercises were very valuable. The leg should be examined regularly from the fifth day until getting up, and early sitting out after operation and childbirth had much to recommend it. All precautions should be doubled if there was a personal or family history of phlebitis.

TREATMENT

Posterior tibial phlebitis should be treated by binding the leg with Elastoplast from toes to groin; this sometimes avoided a femoral extension. Femoral thrombosis caused swelling often heralded by low pyrexia and steadily increasing pulse. The pain was sometimes agonising. The patient should be kept horizontal with the leg in a Thomas's splint on a Souttar's beam, and fluid should be given abundantly. Citrate was valueless as, contrary to current belief, a large dose was a powerful coagulating agent. A thyroid high-protein diet was valuable if a definite degree of thyrotoxicosis was produced. Local applications were valueless, but a cooling friction of menthol in methylated spirit was an excellent placebo. Adhesive strapping sometimes enabled the patient to get up as early as the third week and generally before the sixth.

Superficial phlebitis might be simple or ascending. The latter was more vicious and characterised by a good deal of pain, pyrexia, inflammation, and peri-phlebitis. This type of case had provided the few embolic fatalities after injection treatment of varicose veins. Superficial phlebitis was much more often a spontaneous complaint than the deep variety and the main predisposing cause was previous phlebitis. Especially common was inflammation of the collateral varicose veins which developed many years after femoral thrombosis. Focal sepsis should be sought in every case. A large amount of superficial phlebitis

could be prevented by the early and adequate treatment of varicose veins. Superficial phlebitis was an innocuous complaint in an ambulatory subject but had a definite risk when the patient was in bed. Any fluctuant swelling in the veins should be aspirated and then 2 in. strips of adhesive plaster, $\frac{1}{4}$ in. wide with chamfered edges, were stuck over the affected veins at the upper end of the clot and the whole leg bandaged tightly, from the toes to an upper Sorbo safety pad applied above the clot to prevent its wandering upwards. In ascending phlebitis the pressure applied should be greater and the rubber pad of double thickness. Most cases cleared up in a fortnight. In both simple and ascending types the patient must be kept about, even if he had fever. The bandaging prevented embolus. In 500 cases this treatment had always given excellent results. Embolophobia was a real trouble to many patients, and those who found their phlebitis treated thus lightly were most grateful.

DISCUSSION

Dr. A. P. CAWADIAS complained that Mr. Dickson Wright had dwelt too much on the metabolic element of phlebitis. No one on the continent thought that the condition was due to abnormal cholesterol metabolism. The pituitary gland had a certain regulating rôle on the metabolism of the vessels, and patients with phlebitis often had pituitary syndromes. The incidence of phlebitis in families showed, however, that the metabolic element existed and was important. Physicians should search for this element because much of the future therapy of phlebitis depended upon knowledge of it. Physicians and not surgeons saw such conditions as gouty phlebitis. The medical treatment was the same as the treatment of the sequelæ. Preparations of pancreas, pituitary, and parathyroid were not very helpful and endocrine therapy must be designed on the endocrine formula of the individual patient. Physical treatment was most important, especially with infra-red radiation. Balneotherapy had proved useful, and the best drugs were such preparations as hamamelis, hydrastis, and pulsatilla.

Mr. W. MCKIM McCULLAGH said that death-rates from this cause varied greatly in different hospitals. Where deaths were frequent they might be due to improper aseptic technique or improper preparation of the skin. The maternal death-rate from embolism was 6.8 per cent. of the total in England and Wales.

Mr. C. P. G. WAKELEY said that in listening to Sir Bernard Spilsbury's Harveian oration on pulmonary embolism a few years ago, he had been astonished to hear that sepsis played no part. He recalled vividly a patient of his who had been operated on for hernia and had had a femoral thrombosis which had passed up the inferior vena cava. He had suffered from glycosuria which had been taken to be due to thrombosis. This had suddenly ceased and he had recovered. Thrombi could pass up the inferior vena cava and into the heart without killing the patient immediately.

The CHAIRMAN said that one of his problems was the devastating sequel to a simple appendicitis when, just as the patient was about to go home, the surgeon found that phlebitis had set in, there was a pulmonary embolism and the patient sat up and died. One woman, with a successfully operated diaphragmatic hernia, had done this as she was taking her first good meal. Ligation of the large veins above the clot seemed useless. The patients who caused him anxiety were those who came to the out-patient department with a swollen shoulder and a cyanotic arm. They all cleared up in the end but were terrify-

ing in the beginning. He could not believe that all these conditions were due to strain.

Mr. A. C. PALMER remarked that of the 18 cases in his department in 18 months, not all were due to grave conditions; some had followed curettage and one an examination under an anæsthetic. He had come to the conclusion that sepsis played a very minor part and that perhaps the most important factor was slight trauma associated with personal peculiarity.

Dr. MONTAGUE SMITH related a case in which an elderly man had died after an operation for a growth of the sigmoid. There had been no question of sepsis there. He wondered whether patients with a protuberant abdomen and great long veins were more liable. Some work would be necessary in future, on the lines of Mr. Wakeley's remarks, to determine the real cause of the terrible occasional cases of pulmonary embolism.

Dr. A. H. DOUTHEWAITE observed that the main point of the rare condition of thrombophlebitis migrans was the pulmonary complication: the clotting or phlebitis in the small pulmonary veins which caused agonising crushing pain in one side of the chest and complete immobility, but no spitting of sputum or blood. Some femoral thromboses associated with cancer of the stomach were primarily thromboses in the inferior vena cava. He also had been astonished to hear that sepsis played no part. The temperature in these patients never quite settled after the operation, and this was suggestive of sepsis. Physical treatment was important after the operation and every patient, especially after abdominal surgery, should be given massage of the legs or movements and static traction of the thigh muscles 24 hours after the operation.

Mr. C. HOPE CARLTON drew attention to the associated problem of septicæmia, and quoted the case of a Chinese with an enormous carbuncle who had developed basal pleurisy. The acute phlebitis of the penis occasionally seen in prostatic cases was nearly always fatal; he asked for advice on treatment. In some severer cases of femoral thrombosis, especially where bladder drainage was being carried on, it was impossible to get the patient up.

Mr. D. H. PATEY remarked on the difficulty of estimating whether the forms of treatment suggested by Mr. Dickson Wright were of any value since the incidence of pulmonary embolism was so relatively small. He doubted whether deep breathing exercises would make the diaphragm move; some radioscopic observations he had made indicated that they would not.

Mr. DICKSON WRIGHT, in reply, said he thought the good results claimed at Bagnolles probably had a large psychic element. There was no evidence that phlebitis had a pituitary origin and he doubted whether it would ever be shown to be due to endocrine disorder. A patient with an acute suppurative appendix was more likely to get thrombosis after an operation than one with a clean appendix. The immediate cause was probably increased sedimentation-rate. Obesity was an important predisposing cause. Penile thrombosis after prostatectomy was part of an extensive thrombosis which was well known as a sequel of this operation. Draining the bladder need not interfere with getting the patient out of bed for several hours a day. Ligation was only indicated in suppurative phlebitis; varicose veins were ligated to produce thrombosis. Still more foolish was the practice of excising a mass of inflamed varicose veins.

REVIEWS AND NOTICES OF BOOKS

1935 Year Book of Urology

By JOHN H. CUNNINGHAM, M.D., Associate in Genito-Urinary Surgery, Harvard University Post-graduate School of Medicine. Chicago: Year Book Publishers; London: H. K. Lewis and Co., Ltd. 1936. Pp. 462. 9s. 6d.

THERE must be few tasks more difficult to discharge with success than the editing of a volume reviewing advances in a branch of medicine that is growing rapidly. Dr. J. H. Cunningham has shown skill in eliminating papers that, while interesting enough, throw no new light on the problems of urology, and in including in his volume all those which are of real importance. The chief trend of the 1936 volume is thus to concentrate on significant papers and to quote fully from them rather than to attempt to include isolated scraps from a large number. For example, Mr. Swift Joly's Ramon Guiteras lecture on urinary calculus has been reviewed at considerable length as an excellent survey of the aetiology of calculus. The impression left on the reader by this Year Book is that urology, having gained its independence as a speciality in medicine, is now beginning to develop and maintain a close connexion with other branches of medicine during the study of urinary problems. As an example may be given our growing appreciation of the influence of denervation of the adrenals on conditions such as neuro-circulatory asthenia, hyperthyroidism, peptic ulcer, epilepsy, and polyglandular diseases. This new attack upon the adrenal nerve-supply comes within the surgical province of the genito-urinary surgeon, and it is a field of research full of promise. At the same time it is noteworthy how great is the help now being given to urologists by biochemistry, physiology, and endocrinology.

It would not be remarkable if in a Year Book of the literature on any subject edited in America contributions of American workers should receive special prominence; the national bias occurs in every country. So far as it is possible to do so, Dr. Cunningham has avoided undue partiality, and whilst including important papers from every country, has been particularly generous to British writers.

Incompatibility in Prescriptions

Fourth edition. By THOMAS STEPHENSON, D.Sc., Ph.C., F.R.S.E., F.C.S., Editor of the *Prescriber*; sometime Examiner to the Pharmaceutical Society of Great Britain. Edinburgh: The *Prescriber* Offices. 1935. Pp. 62. 6s.

THE medical student has little time to devote to chemistry and pharmacy and it is only when he is qualified that the subject of incompatibility in prescriptions begins to worry him. This book is conveniently planned to enable him to get the necessary information. It deals largely with the chemical and physical aspects of the subject. That the present edition has been thoroughly revised and brought up to date is evidenced by the notes on acetylcholine, acriflavine, benzocaine, calcium gluconate, and hexyl-resorcinol. The classification of the different types of chemical reactions is good and serves to emphasise the principles underlying the subject rather than to provide a mere list of unrelated incompatibles. Much care has been taken in the compilation of the examples. Exception might be

taken to the inclusion of a statement that magnesium sulphate gives a clear solution with sodium bicarbonate without a warning that such a mixture is liable to explode if kept in a well-corked container. A slow evolution of carbon dioxide inevitably occurs and the rate of the reaction is considerably increased with slight rise of temperature. The prescribing together of these two ingredients, particularly in the presence of bismuth carbonate, should thus be avoided. The need for chemically equivalent quantities of potassium iodide and mercuric iodide to produce a precipitate should have been emphasised; in mixtures the iodide is practically always present in excess. A number of interesting examples of therapeutic incompatibility is given and should suffice to warn the prescriber of some pitfalls. The second part of the book consists of a comprehensive dictionary of incompatibles, including many unofficial substances. It is to be regretted that luminal sodium does not appear under its proprietary name in either the list or the index.

The book fulfils its object and can be recommended as a useful addition to the practitioner's books of reference.

Emotions and Bodily Changes

A Survey of Literature on Psychosomatic Inter-relationships, 1910-1933. By H. FLANDERS DUNBAR, M.D., Ph.D., Departments of Medicine and Psychiatry, Columbia University. New York: Columbia University Press; London: Humphrey Milford, Oxford University Press. 1935. Pp. 596. 25s.

WITH medical knowledge, as with the world's food-supply, the problem of distribution is more baffling than that of production. Distribution is greatly facilitated by the volumes of short abstracts, which are becoming increasingly numerous and popular. This one deals with the old question of the relation of body and mind, and attempts to survey and present what has been written on it in the last twenty years. Part I. deals with the problem in general, and with the various physiological methods—precise in form but disappointing in result—which have been suggested for the investigation of its details. Part II., occupying half the book, works through the physiological "systems" of the body and gives examples of their diseases. Part III. is a short section on therapy, and there follows a bibliography of 2251 titles. The abstracts are fairly full, and quotations and excerpts are freely used.

The book is offered in the first place to the would-be research student as a means of orientation and a guide to what has been written. Papers are chosen for abstraction because they are interesting, not because they are necessarily judged to be sound. In merely arranging them the compiler has done a useful service, and in his few paragraphs of introduction and conclusion he has made the dry bones begin to live. His interest is that of the physician more than that of the philosopher. He finds that medical men, following the biologists, are just beginning to study the organism as a whole, its internal relationships and balances, and its interaction with its environment. The antithesis of mind and body in the human organism is giving place to an attempted synthesis; diseases and symptoms are no longer to be labelled organic or functional (meaning, of psychological origin), but in every case the question is to be, "To

what extent organic *and* to what extent functional ?' This point of view is gaining ground in medicine, and promises to throw light on obscure diseases as well as to broaden the service that medicine can give to humanity; for that reason this book, or parts of it, should appeal to workers in many branches of medicine.

I and Me

A Study of the Self. By E. GRAHAM HOWE, M.B., B.S. Lond., D.P.M., Associate Physician, Institute of Medical Psychology; late Chief Assistant, Psychology Department, St. Thomas's Hospital. London: Faber and Faber Ltd. 1935. Pp. 256. 7s. 6d.

Dr. Howe must be congratulated on a brave attempt to solve by a somewhat new dialectical method the ultimate problems of thought and behaviour. He deals with the problem familiar to philosophers of the unity of the self by the proposition that all experience tends to be a relation of twoness. This concept of relation of two terms as the basis of fundamental logical propositions is not, of course, a new one, and the resolution of antitheses has baffled thinkers since the time of Zeno. Dr. Howe applies his theory of unity to such fundamental psychological problems as the family and society and continues his exposition by a critical analysis of science and modern medicine. He accuses unscientific thinkers of idolatry and the competitive faculty which fights for half truths, always forgetting the other pole of an antithesis. Science, he says, is the study of reality as the external, and omits internal conditions in their relationship to externals or appearances. The truth in science and behaviour can only be reached by the resolution of opposites and the path to this realisation ends with the life of the Saints; he gives St. Francis as the shining example. St. Francis, however, was never able to resolve the antinomy of love and hate, though it is true that he had the capacity to accept both. This does not appear to be Dr. Howe's solution, which implies the resolution rather than the acceptance of opposites. Fundamentally his thesis would logically impose upon him an Oriental rather than a Western philosophy, and his ideal should be not so much a St. Francis as Bodhisattva. It is difficult to see what practical application this book could have, but no doubt Dr. Howe in his next volume will apply his philosophy to the actual problems of living.

Objective and Experimental Psychiatry

By D. EWEN CAMERON, M.B., Ch.B. Glasg., D.P.M. Lond., Physician in Charge, Reception Service, Provincial Mental Hospital, Brandon, Man.; formerly Assistant Physician to the Glasgow Royal Mental Hospital. New York: The Macmillan Company; London: Macmillan and Co., Ltd. 1935. Pp. 271. 12s. 6d.

Dr. Cameron opens his work with an apparent paradox by stating that the study of psychiatry needs dehumanising—freeing from anthropomorphism—and that although we are still engaged in the forging of experimental instruments, the ideals for all future lines of inquiry shall be quantitative, verifiable, and repeatable experiments and observations. Medical science like the other sciences must free itself from animism. And furthermore it must pursue the scientific method however much its findings may meet the obstacle of prejudice which is raised when the

higher functions of the mind are subjected to detached scrutiny and analysis. Dr. Cameron holds that we must once and for all abandon the dualism born of the belief in the inviolate soul and in accepting causality and abandoning free will, accept as a fact that human behaviour is predictable and controllable. Admitting the legitimate claims of gestalt and holism, the author believes that the investigation of partial processes by quantitative experiment will tell us what the organism does, if not what it is, and that this should not be summarily dismissed as a sterile study. Dr. Cameron then proceeds to discuss at length the various partial approaches to the study of psychiatry. Particularly interesting is the chapter on tests for intelligence, the subject being approached with commendable reserve. The importance of environment in determining the quality of the highest level reactions is fully recognised. The chapter on conditioned reflexes takes the literature well up to date, but the one on heredity is all too brief. The rest of the book is devoted to recent researches in combined psychiatric and pathological studies.

The volume is well documented chapter by chapter, and should be in the hands of those students of psychiatry who are interested in the experimental approach.

Vitamins in Theory and Practice

By LESLIE J. HARRIS, Sc.D., D.Sc., Nutritional Laboratory, University of Cambridge and Medical Research Council. Cambridge: University Press. 1935. Pp. 240. 8s. 6d.

IN welding his Royal Institution lectures into a book Dr. Harris has given us a popular account of the vitamins which, in a fairly small compass, sets out most of what a layman ought to know about them. The facts are accurately given, though possibly over-simplified in certain places. The abandonment of a dignified style appropriate to scientific literature in favour of a more lively and colloquial one is a doubtful advantage, and not altogether successful here since it seems to involve a definite loss of lucidity. A great many well-chosen illustrations are supplied and the last chapter entitled "Dietetics—What to Eat" is full of interest. It contains some astonishing data on the improvement in nutritional condition of school-children which has taken place in this country since a genuine science of nutrition has grown up. Acquaintance with such facts as these should hearten all who desire to see progress in this direction go still further.

The Obstetric Pelvis

By HERBERT THOMS, M.D., F.A.C.S., Associate Professor of Obstetrics and Gynecology, School of Medicine, Yale University. Baltimore: Williams and Wilkins Company; London: Baillière, Tindall and Cox. 1935. Pp. 115. 11s. 6d.

Dr. Herbert Thoms has discovered many points of interest about the pelvis in the course of his prolonged and considerable experience. Starting with a comparison of the male and female pelvis, he describes in detail the three normal types of female pelvis that he recognises. He notes that the value of external measurements of the pelvis has long been doubted, and gives much space here to a detailed description of X ray technique, with the use of a grid, as a more close means of estimating the real size and shape of the bony birth canal. It

is of interest that so ardent an advocate of exact pelvimetry as Dr. Thoms is constrained to admit that the deciding factor is generally in the end the efficacy of the uterine contractions. He demonstrates that occipito-posterior positions are more likely to be found in women, who have what he calls the anthropoid pelvis. Final chapters deal with injuries and displacements to the sacrococcygeal joint and the symphysis pubis. The book is well illustrated and makes interesting reading, though most of the subject matter is not new.

Agents of Disease and Host Resistance

By FREDERICK P. GAY and associates, past or present members (with four exceptions) of the Department of Bacteriology, College of Physicians and Surgeons, Columbia University, New York. London: Baillière, Tindall and Cox. 1935. Pp. 1581. 45s.

THIS is a large and ambitious work devoted to the ætiology of parasitic diseases in the most general sense. It deals comprehensively and systematically with immunology, bacteriology, epidemiology, proto-

zoology, and helminthology. There are good reasons why these subjects should be treated together in manuals for the elementary student, but there appears no advantage in such an arrangement on a large scale. It is clear that the editor has meant to produce a "treatise" rather than a book of reference. The connecting thread which runs somewhat faintly through the work is the general pathology of ætiology. Dr. Gay has been assisted by many specialists, chosen mostly from the same medical school in order to achieve a homogeneity difficult to secure when wisdom is drawn from a wider field. Each individual article is well written and no labour has been spared in the editorial share. It seems to us unlikely, however, that students will attempt to read such a long and by no means lightly written work with any approach to continuity. Its form, moreover, offers little encouragement to the reader. The book is heavy to hold and has much small print, and rather niggardly margins. As a work of reference it is no doubt of value, though since we have already many good reference books on bacteriology and cognate subjects, it cannot be said to fill a need. It is nevertheless a sound and learned production which may be consulted with advantage by advanced students, teachers, and research workers.

NEW INVENTIONS

SPECIAL CIRCUMCISION FORCEPS

IN the course of running a minor operation clinic at Guy's Hospital where the work is done by dressers of little or no experience, it was evident that the operation for circumcision entailed under these circumstances considerable needless hæmorrhage, and the results were to say the least of it inartistic.

The blind method, where the forceps are applied to the intact foreskin, gives a neat result, but in theory seems to contravene an essential surgical principle that it is as well to see exactly what you are cutting before you cut, and in practice, under the conditions mentioned above, has occasionally been attended with disastrous injury to the glans.

The method of slitting the dorsum of the foreskin, wiping the glans off the adherent foreskin around the whole of its circumference and removing it with scissors under direct vision after ligaturing the frenular artery has been found to be the safest

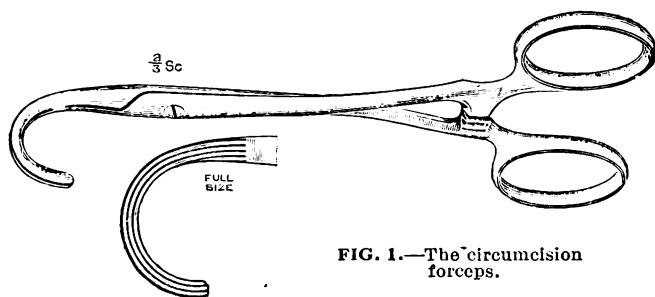


FIG. 1.—The circumcision forceps.

method, but has resulted in a jagged edge, due to the uncontrolled cut, and hæmorrhage from the remaining arteries until these have been secured.

In order to combine the advantages of the first method with the safety of the second the special circumcision forceps were designed and proved so successful that it was thought their use might profitably be extended to those with more experience.

The foreskin is slit along the dorsum exactly in the midline as far as the corona, this manœuvre being attended by a minimal amount of bleeding. The glans is wiped off and the frenular artery secured. The special forceps are then applied to the foreskin around one-half of its circumference about $\frac{1}{2}$ cm.

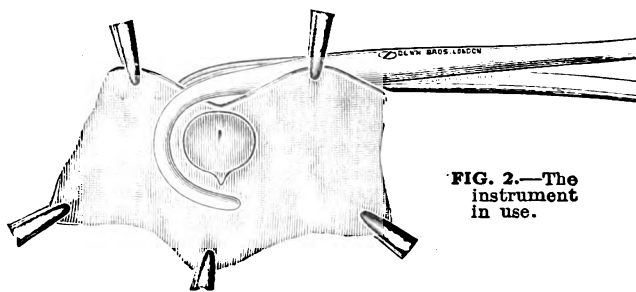


FIG. 2.—The instrument in use.

away from the penis as shown in the illustration. The foreskin is pared flush with the instrument and two fine catgut mattress sutures are inserted passing through both mucous membrane and skin between the forceps and the penis. On removal of the forceps there is accurate apposition of skin and mucous membrane and generally no bleeding whatever from the crushed vessels. The instrument is then reversed, the remaining foreskin removed, and two more mattress sutures inserted. A sterile finger bandage soaked in tinct. benzoin co. and applied to the penis completes the operation.

Dressers performing the operation for the first time produce with these forceps a comely effect, take half the time, and succeed in letting blood only to the extent of just staining their fingers, whilst those with a little more experience find it a useful and practical method.

The instrument is manufactured by Down Bros., St. Thomas's-street, London, S.E., and can be supplied in any size.

H. J. B. ATKINS, F.R.C.S. Eng.

THE LANCET

LONDON: SATURDAY, MARCH 14, 1936

INDUSTRIAL PULMONARY DISEASE

THAT the incidence and fatality of silicosis in Great Britain during the last few years is probably much greater than is suggested by the number of notified cases and death certificates is a conclusion that may fairly be drawn from Dr. E. L. MIDDLETON'S Milroy lectures, delivered before the Royal College of Physicians on Feb. 27th and March 3rd. Silicosis is now recognised as the most important of that group of diseases which have been termed collectively the pneumoconioses. In this country it is always the result of prolonged exposure to certain kinds of dust in the course of occupation. The chief symptom is progressive dyspnoea; the chief sign, detectable in life by X rays, is the presence of fibrous nodules in the lungs, which appear post mortem as palpable macroscopic nodules. According to Dr. MIDDLETON recourse to histological examination is usually necessary for diagnosis only in the presence of such complications as tuberculosis—by far the most common one—and malignant disease. He pointed out that the presence of tuberculosis may render the diagnosis very difficult and quotes E. H. KETTLE'S statement¹ that since the differential diagnosis depends on the amount and distribution of the collagen in the tissue reaction, it is a matter of degree.

Silicosis is not reportable, as are certain other occupational diseases, and until a few years ago the term had hardly been used for the purpose of certifying the cause of death in this country. Since the beginning of 1930, by arrangement with the Registrar-General, the Home Office has obtained copies of the certificates of all deaths due to fibrosis of the lungs, silicosis, asbestosis, or pulmonary disease due to dust. Dr. MIDDLETON, from his official appointment, was thus in a position to collect data not previously available. During the five-year period 1930 to 1934 inclusive the number of deaths included in the group was 4038. In 1521 of these silicosis was mentioned on the certificate as a cause of death. The deaths were divided among 29 industries; the figures remain fairly constant for each over the five-year period except for coal-miners, who show a steady increase from 41 in 1930 to 85 in 1934. They head the list with a total of 326 deaths for the five years, the next important groups numerically being those engaged in the manufacture of pottery (270), sandstone masons (255), metal grinders (142), sandstone quarriers and dressers (117), and gold-miners who had returned home from South Africa suffering from the disease (104). Analysis of the 270 pottery deaths showed that the occurrence of silicosis

among potters is always preceded by exposure to flint dust either alone or mixed with clay. The actual number of deaths in each industry has of course less significance than their proportion to the number of workers at risk, but this figure is rarely obtainable. For example, in the census of England and Wales for 1931 the total number of sandblasters amount only to 1395; 17 of them died of silicosis in that year and 45 in the five-year period, giving a mortality-rate of 6.4 per 1000 living, which would be still higher if the census figure did not include shot blasters working on clean metal who are not exposed to siliceous dust. The dust hazard is from the abrasive, usually a quartzose sand or crushed flint, which has now been largely replaced by metal grit or shot. A striking fact which emerges from the investigations on sandblasters is the shortness of the period of employment which led to death from silicosis, compared with other occupations. Another industry, the manufacture of abrasive soaps, was altogether abandoned at one factory in 1928 owing to the death of workers, attributed to inhalation of the dust. Out of a total of 81 persons employed in the process at this factory, 22 left within two months of beginning work, 1 of these dying eight years later of tuberculosis. Of the remaining 59 employed 13 died of tuberculosis or silicosis. In tin-miners the 91 men who died of silicosis in the period under review represent an annual fatality-rate of 11 per 1000 wage-earners employed in the industry in 1934. Hæmatite mining, formerly considered free from risk, is now known to produce silicosis, and during recent years evidence has been accumulating that certain workers employed in coal-mines contract a disabling and even fatal fibrosis of the lung. Dr. MIDDLETON detailed the processes underground in a coal-mine which involve exposure to siliceous dust, and noted that between June, 1931, and December, 1935, the Silicosis Medical Board of the Home Office issued 987 certificates on account of silicosis in coal-mines; these included 237 suspensions, 581 certificates for total disablement, and 169 for death. In these and other occupations in which silicosis, that is, the nodular form of pulmonary fibrosis, occurs, the workers have been exposed to the dust of free (uncombined) silica. There are, however, other industries which involve exposure of workers only to combined silica in the form of silicates. The type of fibrosis produced in the lung by the action of silicates, such as fireclay, sillimanite, china clay, talc, and mica differs from that produced by free silica, and can be distinguished from it by radiological and histological means. The pulmonary symptoms and signs arising from exposure to silicates are generally slight, asbestos dust being unique amongst them for the prevalence and severity of the disease which it causes. During the five-year period 50 deaths were certified as due to asbestosis. In view of the gravity of these scourges it is satisfactory to learn from the annual report of the Medical Research Council, noticed elsewhere in this issue, that their committee on industrial pulmonary disease, appointed at the request of the Home Office in 1930, have now in progress a

¹ Proc. Roy. Soc. Med., 1933, xxvi, Sect. Path. p. 23.

carefully planned and coördinated programme of research. The problem is being attacked from all possible aspects—physical and chemical, experimental and pathological, clinical and statistical—since at present preventive measures are severely hampered by lack of exact knowledge. Silicosis is insidious in its onset, and it is not known how much of the dangerous dust must be inhaled, and over what period, to produce disabling effects. Much also remains to be discovered as to the influence—as regards degree of danger—of the size-distribution and concentration of the dust particles at the time of inhalation. Research into the physical nature of the dust clouds capable of producing disease was accordingly one of the first undertakings of the committee, and this is now being pursued by means of a new form of thermal precipitator devised by H. L. GREEN and H. H. WATSON.² More recently the committee have been considering the need for further study of the chemical properties of dusts arising from industrial processes, such as the composition of the particles and their solubility under different conditions, and this work will be done under the direction of Prof. H. V. A. BRISCOE. Meanwhile, biological investigations on the subject are being continued, notably pathological investigations of material from human cases of industrial pulmonary disease and experiments on the different effects which dusty atmospheres of various kinds have on the lungs of animals. Direct studies of disease in the living subject are also being made as opportunity offers, but the possibilities of making progress in this direction are slight. Most of the symptoms produced are not peculiar to disease owing its origin to dust, and the question thus becomes a statistical one, involving a comparison between the incidence of pulmonary disease among persons exposed to dust inhalation in their occupations and the incidence in the general population; but the task of obtaining records for strictly comparable groups of people, differing only in the one respect of exposure to dust, is beset with serious practical difficulties.

The other side of the problem, which concerns the Home Office rather than the Medical Research Council, involves the arrangements under which victims of industrial pulmonary disease or their dependants can obtain compensation from employers. A memorandum on the Industrial Diseases of Silicosis and Asbestosis issued a year ago³ gives a succinct account of the various schemes providing for compensation and of the medical arrangements for examination and certification of cases. The memorandum states that compensation in cases where death or disablement is caused by silicosis, or silicosis accompanied by tuberculosis, is now payable in all the industries where a serious risk of the disease exists. That the mechanism is not as smooth as might be desired is plain, however, from the periodical complaints in Parliament of which the most recent is reported on p. 632 of this issue. Last month⁴ Mr. LEACH

asked the Home Secretary if he would consider introducing further legislation to ensure prompt and easier certification of cases of silicosis in the mining and quarrying industry, and to ensure that compensation and measures for the recovery of the victims might be made more certain; and, as a supplementary question, whether he did not agree that "both the law and the regulations operate very harshly towards these poor fellows." Sir JOHN SIMON, in his replies, said that he would be happy to consider any suggestion for the improvement of the medical arrangements and the procedure under the Silicosis Schemes, and that he had the fullest sympathy with those who wanted to have the whole situation cleared up and simplified. It is clearly desirable that medical men should familiarise themselves not only with the criteria for the differential diagnosis of the various industrial pulmonary diseases during life but with the present mechanism for obtaining compensation, in order that any remediable defects in it may be exposed and adjusted.

PEPTIC ULCER

Dr. DANIEL DAVIES has done a service in projecting peptic ulcer once more on the screen of public attention and interest, for the real problem of its cause and mechanism is apt to be neglected by those whose first concern is of necessity to treat its symptoms and its complications. His Bradshaw lecture, which appears in our last issue and in this, is a clinical study of 377 cases of chronic peptic ulcer, on the features and fortunes of which he makes some useful observations. He prefaces these by a reference to the experimentalist's success, achieved at last, in producing chronic peptic ulcer in animals. F. C. MANN and his colleagues diverted the bile and the pancreatic juice in dogs into the lower ileum, and half of them developed duodenal ulcers. When the duodenal secretion also was diverted, and the stomach anastomosed directly to the jejunum, jejunal ulcer developed in nearly every animal. The ulcers were histologically just like chronic peptic ulcers in man, and their occurrence at precisely those spots in the intestine on which the acid gastric content impinged points very strongly to the acidity as a prime factor in their causation. Rapidly advancing ulcers could reach the stage of perforation in 48 hours, and three weeks was long enough for the typical appearances of chronic ulcer to develop.

Dr. DAVIES looks for clinical parallels to these phenomena. His figures for gastric acidity illustrate the common finding that in patients with duodenal ulcer the gastric juice is either normal or above normal both in amount and in acid concentration. This is usually regarded as a constitutional trait of the patient. Dr. DAVIES, however, found a number of cases where the acidity appeared to be lower after treatment, and he wonders whether it may not often fluctuate more than is realised. This question is extraordinarily difficult to answer. Even the acid concentration

² Medical Research Council, Special Report Series No. 199, 1935.

³ H.M. Stationery Office, February, 1935, 4d.

⁴ See THE LANCET, March 7th, 1936, p. 576.

measured in the ordinary test-meal, depending as it does on half a dozen or more variables, is not easy to interpret, and no kind of test-meal can be expected to give a very accurate picture of the acidity to which the duodenal mucosa is exposed throughout every 24 hours. HENNING's work¹ on the persistent nocturnal secretion of acid in patients with duodenal ulcer needs emphasis again in this connexion. BLOOMFIELD and POLLAND,² advocating the simple examination of the pure juice secreted in response to histamine are recognising the uncertainties of the test-meal methods, and transferring their attention from what the stomach perhaps does, to what the stomach, maximally stimulated, can do. Their method should help to define some of the determinants of gastric acidity, though it will not give a full answer to Dr. DAVIES's question. Among the gastric ulcer cases his figures show less departure from the normal range than do the duodenal ulcer figures, and in both there is so much overlapping between normal and abnormal groups that the acidity level in any single patient is of very little diagnostic value indeed. There remains, however, the obvious general relation between acid and ulcer, both in man and in the experimental animal, and therein lies at present the justification for alkalis and other antacid measures as a part of ulcer treatment.

Dr. DAVIES's radiological findings bring further evidence that gastric ulcers often heal—or at least go so far on the way to healing that their niches disappear—within a few weeks, and he has some significant examples of the reappearance of craters within similarly short spaces of time. It is quite likely that the ulcer itself, like the ulcer dyspepsia, comes and goes with a mysterious alternation. The problem broadens at once. It is not a single ulcer that is to be dealt with, but a stomach that has developed a habit of ulcerating. Is any gastric mucous membrane capable of behaving like this? No, only subjects with a constitutional proclivity will have ulcers; that is the answer of HURST and those who believe with him in ulcer diatheses. More evidence on this topic is needed, and it would clarify matters greatly if the evidence were presented under two headings such as these. First, there are observations like the occurrence of ulcers in families, from which a constitutional factor may be inferred, but not defined. Secondly, there are observations such as the commonly accepted relationship of high acidity to duodenal ulcer, or DRAPER's anthropometric measurements, which go some way towards defining in anatomical or physiological terms the constitution in question. No diathesis is satisfactorily described until such definition is achieved, and the means by which the constitution invites the disease made clear. But if we grant the existence of an ulcer diathesis as a working hypothesis, we next inquire what sets the stomach ulcerating. Is it a direct infection? No organism has been convicted, but a virus has not been excluded. Is it toxins from

a distant focus or from without? Is it an excess of mechanical or chemical stimulation? More factors than one are likely to be involved and among them Dr. DAVIES stresses the psychological one. In general he thinks the increasing incidence of peptic ulcer may be related to the increasing psychological strain of modern town life; in particular he quotes many examples of the development or recurrence of ulcers following emotional upsets and strain. He pleads, therefore, for "a treatment which is wide enough to envisage the whole man and his environment." It may be more important to lessen anxiety or limit responsibility than to diminish acidity. The weeks in bed insisted on by most régimes for the medical treatment of ulcer usually achieve this, if only incidentally and temporarily. Dr. DAVIES, obliged to treat his patients ambulant, has no doubt dealt with their psychological problems more directly and less short-sightedly, for his results so far as they can be assessed at this stage are not unsatisfactory. He ends with another protest against the hard demarcation of "functional" from organic disease; he is right, and the doctrine needs more preaching, for it is so easy to acquiesce in and so difficult to practise.

THE IMPORTANCE OF GONORRHEA

THE high incidence of gonococcal infections in all civilised communities and the relative failure of measures by public health authorities to check or control their spread are facts which the lay public and most of the medical profession seem to view with indifference. Gonorrhœa is not a spectacular disease. Its emergencies are few and its mortality negligible. Its victims do not make themselves conspicuous. Yet there can be few diseases which bring in their train such misery and wretchedness, so much ill-health and incapacity, so many permanent ill-effects on mind and body. Far more often than not, it affects the young, the strong, the producing section of the community; and its total cost to any nation is beyond computation in terms of public health estimates.

Many factors have combined to negative the efforts which have been made and are being made to cope with this disease. The absence of a specific remedy, the necessity for concealment, the lengthy and dispiriting treatment, family reinfections and inadequate standards of cure, are real bars to progress. But perhaps the lack of inspiration and encouragement to the aspiring investigator—a lack which reflects the popular appraisal of the problem—has done more than anything else to produce what PELOUZE describes as almost twenty years of stagnation of scientific and clinical interest. Recognition of this need for coördination and stimulation of research led to the appointment in the United States in 1932 of a Committee for the Survey of Research on the Gonococcus and Gonococcal Infections. The report of this committee, which is issued as a supplement to the January number of the *American Journal of Syphilis, Gonorrhœa and Venereal Diseases*, reflects great credit upon the assiduity and

¹Henning, N., Norpoth, L.: Arch. f. Verdauungskr., 1933, liii., 64.
²Jour. Amer. Med. Assoc., 1929, xcii., 1508.

discrimination of those concerned in its preparation, and will be found directly valuable by all who have to treat gonococcal infections. The nature and the magnitude of the problem is indicated by the estimate that in the United States alone there are a million cases a year. The committee's contribution towards a solution consists in the first place of a statement of the biology of the gonococcus, presenting the known and accepted facts with a critical summary of what has been written on the subject in the past five or six years. Some 50 further pages are devoted to the results of research into gonococcal infection in man, and here the compilers are able to maintain the same keenly critical attitude—except occasionally, and naturally, in relation to the investigations of workers with whom they are in close contact. Finally the report contains a summary, a discussion, conclusions, and suggestions for future developments. A study of the document as a whole must convince the reader that its authors are right when they deplore the confusion of thought over these problems, the lack of unanimity on fundamentals, and the fact that conclusions are often drawn and defended on wholly inadequate

grounds. They also note that there is much wasteful overlapping of effort by research workers, and where, as often, this is due to their being out of touch with current publications, the present report will do much to remedy the deficiency. Financial and other facilities are held to be insufficient, and it is remarked that many who receive an adequate preliminary training in this type of work pass on, through force of circumstances and often through no wish of their own, to other spheres of labour. The committee thinks it probable that less than ten centres in the whole of the United States are engaged in serious study of gonorrhœa.

Few will deny that these criticisms and conclusions are equally applicable to the state of affairs in this country, and it is to be hoped that signs of awakening interest abroad may lead to a more general realisation of the importance of the problem here. The encouragement, coördination, and financing of inquiries into cancer have become a national concern, backed by the interest and support of the medical profession and all classes of the community. Is it too much to expect that some comparable attention may be given to the urgent demands of the gonococcal infections?

ANNOTATIONS

THE RADIOLOGIST'S PROPERTY IN HIS NEGATIVES

THE British Institute of Radiology has found it necessary to make a pronouncement as to the property in radiographic negatives of private patients. It states with authority and confidence that the property is in the radiologist by whom, or under whose instructions, or in whose department, the negative is made. The statement is applicable also to hospitals where arrangements permit the visiting radiologist to receive and examine private and paying patients; the hospital receives a proportionate part of the radiologist's fee towards the cost of materials used. In the case of hospitals this problem of property can be highly important because insurance companies and solicitors are sometimes inclined to demand as of right the visible results of the radiologist's work. Sometimes also patients raise the same question. If disposed to dispute liability for fees, they have been known to argue that there is nothing to pay for if the negatives have not been handed over. When that argument was used last year in an American case, the Supreme Court of Michigan disposed of it very sensibly. Radiographic negatives, said the judges, were practically meaningless to the layman; they were an important part of the doctor's clinical records, valuable to his professional experience; they were analogous to the microscopical slides which doctors prepare as an aid to diagnosis and treatment and which would hardly be said to belong to anybody but to the doctor who prepares them.

Patients unfortunately are apt to think of themselves as visiting the radiologist to have an X ray photograph taken just as they go to a professional photographer's studio for their portraits. In the latter case, where the sitter pays for the portrait, the copyright is in the sitter though the legal property in the negative remains in the photographer, though part of the bargain may be that the photographer is not at liberty to sell copies or to use the

negative without the sitter's authority. That was the decision in *Boucas v. Cooke* in 1903, where Cooke, the "boy preacher," had his photograph taken (for payment) in order that a block might be made for reproducing his portrait for distribution at missionary meetings. The analogy of portraiture is shown by the British Institute of Radiology to be misleading. Patients do not visit a radiologist in order to purchase a picture of their bones, nor should they be encouraged in any such idea. The radiologist makes his examination in order to reach an opinion about the patient's condition; the radiogram is merely incidental to the formation of that opinion; indeed it may happen that an opinion can be formed from screen examination alone and, if so, the radiologist's fee is none the less payable.

HISTORICAL ASPECTS OF PSYCHOLOGY

IN the paper he read at the Royal Society of Medicine last week Prof. Millais Culpin pointed out that the history of psychological medicine had not been one of steady progress since the eighteenth century. Stahl, for example, had propounded his valuable conceptions, in many ways akin to those which now hold the field, but his views had not influenced the course of medical opinion about neurosis during the succeeding two centuries. Within the last fifty years great changes had taken place. The artefacts of Charcot's clinic in France could be paralleled in their own time by the outbreak of "railway spine" in this country; the medical attitude to both was influenced by the notion of purely physical causes and by an aversion from teleological interpretation. In spite of the refutation of Charcot's teaching about hysteria by Bernheim, and the researches of Janet, Morton Prince, and the psycho-analysts, it was not until the outburst of psychogenic disorders in the late war that a psychological approach to hysteria and other neuroses began to prevail over the neuronic and molecular explanation of their pathology. Freud's views were those of a pioneer and a genius, but, looked at

historically, they seemed to have been put forward on to a scene that was set for them; a dynamic psychology, working in part with the conception of unconscious mental activity, had been adumbrated by various physicians and philosophers, and the situation was not unlike what had occurred earlier at moments of vicissitude in the history of psychological medicine. Unduly simple interpretations, whether in terms of conditioned reflexes or endocrine glands, were to be met with succeeding each other now, just as Haller's "irritability of nerves" had followed van Helmont's *Archæus*, at the time when Stahl was proffering vainly a more adequate explanation of the part played by states of mind and total dispositions in causing mental and physical disease.

The discussion which followed Dr. Culpin's address ranged from the therapy at Epidaurus to the claims of modern psychopathology. The members of the section of history of medicine were evidently agreed that in psychiatry, as in every other branch of medicine, a true and wide picture of the present state of our knowledge could not be obtained unless one paid heed to the historical background. It is, however, a common observation, as in the case of Freud to which Prof. Culpin drew attention, that innovators and men of genius are often without a full knowledge of earlier and contemporary work in their field. Such ignorance may be a source of strength; it enables them to follow new lights, undeflected. This argument is not entirely at variance, however, with the orthodox one so strongly urged in the discussion. Few are called to be innovators of ideas, and even men of genius are much influenced by the work and ideas that prevail in their time or have preceded them.¹ Other recent writers² on Dr. Culpin's theme have pointed out how regularly psychological medicine has followed the fashions and philosophies of the period; unwitting assumptions are made, current belief is mistaken for assured fact, and familiar general modes of thought are woven into the new structure. The influence of Nietzsche, to which Dr. Cawadias referred, has doubtless played a part in moulding the psychological theories of to-day; a more detached historical view than that possible to the psychopathologist might discern in his accepted tenets of the moment much that derives from biological and philosophical habits of thought which are now being superseded or reshaped.

A STUDY OF HYPERNEPHROMA

In introducing his monograph Prof. P. Bull makes a modest disclaimer. It contains, he says, "no original ideas on the pathogenesis of hypernephromata, no unknown pathological-anatomical discoveries, nor any new clinical observations. . . . The work is primarily written for my Norwegian colleagues. . . . As it has been my lot to treat a comparatively large number of hypernephromata, I have felt it as a kind of duty to give an account of my own clinical experiences during more than twenty years." The monograph was subsidised by the Malthe Fund and is published as a supplement to the *Norsk Magazin for Lægevidenskaben* for January. That 37 cases of hypernephroma of the kidney may be seen in a score of years by a general surgeon, not limiting his

activities to the urinary tract, is an indication that the condition must not be considered altogether rare. Of the 37 patients 21 were males, and three-quarters of the total were between the ages of 40 and 59. Hæmaturia was the first symptom in about a third, while in another third hæmaturia plus pain were the first manifestations. Only about half the patients showed macroscopic hæmaturia when they came to hospital, and 8 did not even show microscopic hæmaturia on admission. Pyuria was demonstrable in only every sixth case. It will thus be seen that the routine laboratory examination of the urine is apt to be defective as an aid to diagnosis. Pigmentation of the skin was observed only in 1 case, but among the 21 males no less than 5 suffered from varicocele. Pyelography provided convincing evidence of a new growth in 18 out of the 21 cases thus examined, and Bull thinks that hæmaturia traceable to the kidneys, but otherwise of doubtful origin, should be an absolute indication for pyelography. In all, 26 of the 37 patients underwent nephrectomy, which in 20 cases was extraperitoneal and in 6 transperitoneal. The ultimate results justify operation, although it was not always successful in preventing recurrence. All the 5 cases with thrombosis of the renal vein or vena cava ended in this way; but, on the other hand, the prognosis when the lymphatic glands about the renal vessels showed metastases proved not absolutely hopeless.

SURVIVAL IN PULMONARY TUBERCULOSIS

By careful inquiry into the after-histories of patients treated at sanatoria, various attempts have been made to assess the success attending the treatment of patients with pulmonary tuberculosis. One of the more extensive surveys was made by Sir Percival Horton-Smith Hartley, R. C. Wingfield, and J. H. R. Thompson¹ and related to the patients treated at the Brompton Hospital Sanatorium at Frimley during the years 1905-14. Since 1924, when the report of this survey was published, the After-History Records Department at the hospital has functioned continuously, and functioned so successfully that rather less than 8 per cent. of the patients have been lost sight of. The material available for analysis has consequently become very considerable, amounting to 8766 patients admitted to the sanatorium between 1905 and 1931. The records of these patients—largely representative of the classes of insured persons of the London area—have been made the subject of a valuable report by Horton-Smith Hartley, Wingfield, and V. A. Burrows.² The numbers involved have made it possible to study the after-histories of patients of each sex separately, of different age-groups, and of different grades of severity. For the last the classification suggested by the Ministry of Health in Memo. 37/T has been adopted—namely, Grade A, patients T.B. minus, and Grade B, patients T.B. plus, divided into three groups of increasing severity. For each of these groups the mortality experience has been computed, the figure adopted for comparison being the probability of surviving five years after the date of admission to the sanatorium and at the expiration of each succeeding year. Against these probabilities are placed the corresponding figures from English Life Table No. 9, which was based upon the deaths of 1921-23.

Examination of the figures shows that the mortality

¹ Pagel, W.: Religious Motives in the Medical Biology of the Seventeenth Century. Bull. Inst. Hist. of Med., 1935, iii., 97, 213, and 265.

² Greenwood, M., and Smith, May: Pioneers of Medical Psychology. Brit. Jour. Med. Psychol., 1934, xiv., 1 and 158; Lewis, A. J.: Historical Survey of Melancholia. Jour. Ment. Sci., 1934, lxxx., 1 and 277.

¹ Med. Res. Coun., Spec. Rep. Ser. No. 85, 1924.

² The Expectation of Survival in Pulmonary Tuberculosis, Brompton Hospital Reports, vol. iv., 1935.

of these patients depends almost entirely on the stage of the disease at entry and is relatively unaffected by sex or age. The prognosis varies directly with the extent of lung involved, though the authors point out that striking individual exceptions are often encountered. The prognosis of the average case unfortunately does not appear to have changed materially during the past thirty years, for the patients of more recent years show after-histories very similar to those of cases treated in the earlier years of the period studied. On the other hand it seems that for a selected class—namely, patients treated by artificial pneumothorax—modern treatment has considerably improved the prognosis. The majority of patients chosen for this treatment belonged to the class B3—i.e., with little or no prospect of recovery—because in the majority of cases this treatment was not used until the usual routine treatment had proved ineffectual. Comparison of this group with the experience of all the remaining patients of the same sex, medical grade, and age at admission shows a probability of survival materially increased in those so treated, the benefit enduring for at least 12 years. This method of comparison appears to be the best available but it inevitably leaves the reader wondering why if two patients are really equal in all relevant characteristics one is chosen for A.P.T. and another not; does some unrecognised or immeasurable factor lead to the discrimination and is this factor correlated with survival? A fundamental factor in the prognosis of the pneumothorax cases is shown to be the freedom from disease of the contralateral lung. Presumably the control group did not differ in the frequency with which this characteristic was present. An important feature of the authors' tables is the high mortality in the second and third years after admission to the sanatorium. This, as they point out, may be due in part to the fact that it may be several months before the disease terminates in death, but it also emphasises the well-known fact that the most perilous year for a patient suffering from tuberculosis is the year following his discharge. He has then to face conditions of living and occupation and may relax that "careful watchfulness over his general routine of life" which no sufferer from pulmonary tuberculosis can ever afford to neglect however secure his health may appear.

A special analysis has been made of the distribution of deaths over the calendar year, and it is found that the monthly variability is greater for deaths of the Frimley patients than it is for the deaths from pulmonary tuberculosis recorded in the general population but less than the variability of other causes of death in the general population. This intermediate position of the Frimley patients points, the authors argue, to the conclusion that the mortality experience of patients who have had sanatorium treatment is more favourable than that of members of the general population suffering from pulmonary tuberculosis. The argument is not very clear. If a relatively high monthly variability of deaths can be taken as evidence of increased vitality then it would seem that the comparison needed is between ex-sanatorium patients and other patients with pulmonary tuberculosis, both groups dying of *any cause*. The comparison of ex-sanatorium patients dying of any cause with other patients dying only of pulmonary tuberculosis *must* give a greater variability to the former, since tuberculosis has less seasonal variability than many other causes of death. The authors' belief that this statistical evidence is the first to show the value of sanatorium

treatment needs, we think, careful consideration. From their final conclusion no observer of tuberculosis patients is likely to differ. They conclude that in the majority of cases "two stages may be observed—the first symptomless, the second symptom-producing; that for this reason all too frequently patients with early disease fail to seek advice; that modern methods of treatment can only improve the prognosis where the disease is not too extensive, so that the patient can fall into a selected category; that he is unlikely to fall into this class, unless the disease can be detected during its symptomless stage. This must be the goal of clinical research if further progress is to be made." The perfection and more general use of radiology during the last ten years, encouraging earlier diagnosis and more accurate control of treatment, may well show a beneficial effect when, as is to be hoped, this admirable investigation is extended in another ten years' time.

NERVOUS COMPLICATIONS AFTER SPINAL ANALGESIA

THE possibility of damage to the central nervous system from endothelial injection has been a subject of controversy since the early days of spinal analgesia. There have always been some who maintained that nervous sequelæ were numerous and serious; others who asserted the opposite. The former, it must be admitted, could rarely bring definite evidence in support of their belief and were apt to fall back on the statement that "neurologists saw many cases of trouble after spinal injections." Gradually knowledge is becoming more definite and it appears that the risk of damage from endothelial injection must be accepted as a real one, although it is at present quite impossible to estimate how its frequency compares with the frequency of undesirable symptoms after inhalation anaesthesia. Nor is it possible to compare the comparative frequency of really serious sequelæ after the two methods. For such comparisons we need parallel series of cases embracing very large numbers, and even then unless the operations and the conditions of the patients in the two series were substantially similar the comparison would be of little value. The kind of damage which may follow spinal analgesia is well shown in a recent article¹ from New York which is of value because of the full description of the cases, seven in number, and of the microscopic post-mortem evidence in one of them. The authors give no indication of the number of cases among which these seven occurred, so that our knowledge of the frequency of damage is not furthered by the article in question. It would appear that a meningitis, of non-septic nature, is not an uncommon sequel of spinal injection. This is recovered from rapidly, but when the nerve-roots, and still more the cord itself, are affected the trouble is more serious and may be permanent. Paralysis arising in this way is exemplified in one of the seven cases quoted by the American authors and H. K. Ashworth cited² a similar instance. Dr. Ashworth stated that minor symptoms or lesions after spinal injection were not infrequent and often persisted, although he believed serious or dangerous sequelæ to be rare. His investigation of patients with post-operative nervous symptoms showed the importance of a thorough examination, several instances being found where symptoms demonstrably due to some other cause had been attributed to the

¹ Brock, S., Bell, A., and Davison, C.: Jour. Amer. Med. Assoc., Feb. 8th, 1936, p. 441.

² Proc. Roy. Soc. Med., 1933, cxxvi., 501.

spinal injection. Endothelial analgesia is so valuable a method, and in some circumstances so superior to all others, that it is very important for its risks to be understood and every possible means taken to obviate them. Besides the patent necessity for strict surgical cleanliness there is need for care both in the method of making the injection and in the choice of dosage. With regard to the last point it is to be noted that the doses of procaine used in the New York cases were in several instances much above those commonly injected in this country.

ALCOHOL IN HOSPITAL PRACTICE

Dr. Courtenay Weeks has collected some interesting statistics showing the decline in the use of alcohol in hospital practice from 1900 to 1934.¹ In 1934 the hospitals of the British Empire spent, on an average, only 3.8*d.* per patient on wines and spirits. Most of the hospitals in the London area spent more than the average. St. George's, for example, spent 20.4*d.* per head and this far from convivial figure shows a decline of 4*d.* compared with the figure for 1923. In the provincial general hospitals the decline was equally marked. Exceptions, murky or glittering as you will, were the Margate Royal Sea-Bathing (28.5*d.*) and the West Kent (22.8*d.*). In Ireland, the Tyrone County Hospital spent 22.4*d.* per head and the Dublin Meath 18.2*d.* Nor does Scotland stand where she did. Only the Oban (W. Highland Cott.) and the Johnstone and District Hospitals spent more than a shilling a head. Except for the Merthyr General Hospital (25.3*d.*), the Welsh hospitals were all below the average. Of public assistance institutions, the Bristol-Southmead Municipal Hospital spent 22.6*d.* and the Dartford (Kent) 19.7*d.* The L.C.C. General, the Women's and Children's Hospitals, and the sanatoria all returned low figures. Bootle (Linacre) was the only hospital for infectious diseases to return a figure as high as 19.3*d.* English mental hospitals (4.8*d.*) were markedly more abstemious than either Scottish (11*d.*) or Irish (16.5*d.*). All hospitals of the Empire overseas returned low figures and the same is true of the European countries though many French hospitals freely prescribe "Potion de Todd," a strongly alcoholic carminative. Dr. Weeks's object in collecting these statistics is to preach the cause of temperance. He claims that they prove that the profession no longer believes in the therapeutic value of alcohol. No doubt his claim is partly true, but other factors, for example, the increased cost of alcoholic liquors, must also be responsible for their diminished use. The propaganda which accompanies the statistical data may prove tedious to some readers. Had Dr. Weeks contented himself with a plain statement of facts he might perhaps have carried greater conviction.

ACUTE POISONING FROM CORROSIVE SUBLIMATE

MERCURY bichloride is, after arsenic, the commonest metallic poison responsible for acute poisoning. The intention is most commonly suicidal, but many accidental cases are on record. As little as grs. 3 has been fatal, but much larger doses have been taken with survival. The poison always causes intense vomiting, so that most of it is generally eliminated within a few minutes. The vomiting is usually persistent and is soon accompanied by profound purgation. Occasionally death occurs within a

few hours from collapse following the intense dehydration and dechloridation. More commonly death takes place in 5 to 10 days from uræmia, and in these there is anuria, generalised œdema, and very high blood-urea. There is, however, a paucity or absence of published data on the quantitative elimination of the metal during life and on its distribution in the organs after death. These data must necessarily be of fundamental importance in guiding treatment, and recent chemical studies by Sollmann and Schreiber¹ are accordingly of considerable interest and value. Their material was derived from four patients seen during life and three autopsies, and a very large number of careful analyses were made. These showed that immediate gastric lavage is important, but that subsequent lavage of stomach or colon is of little effect. The first gastric lavage should be very thoroughly carried out and many pints of water used for the washing. The fæces are the principal vehicle for the excretion of the metal, and enemas were thus of value only if the patient had not had the usual diarrhœa, for copious colon irrigations yielded negligible quantities of mercury in the non-fæcal washings. In their autopsy studies Sollmann and Schreiber found that the concentration of mercury is uniformly highest in the kidneys; the liver follows with about half to two-thirds of the concentration in the kidneys; then the spleen with one-seventh, the intestines with one-ninth, the heart, skeletal muscle, and lungs, with about one-fifteenth; and finally the brain with one-twenty-seventh. The concentration of mercury in the blood was 0.015-0.12 mg. per 100 c.cm., about one-fortieth of that in the kidneys. It seems rational to combat the early loss of water and chlorides through vomiting by giving continuous intravenous saline by the drip method. At the same time great caution should be exercised to avoid waterlogging in view of the probability of renal damage. The control of the quantity of saline administered by the usual criterion of the volume of urine passed is obviously unsafe as there may be suppression of urinary excretion.

PRURITUS AND LEUCOPLAKIA

PRURITUS vulvæ, with or without pruritus ani, is one of the most distressing and intractable of all the commoner affections of the skin and adjacent mucous membrane. There are grounds, moreover, for thinking that its incidence is increasing, and the paper by Dr. Elizabeth Hunt which we publish on p. 592 will be useful both for its careful analysis of causation and for its suggestions about treatment. In a longer treatise which has just appeared elsewhere² she has analysed in detail no less than 73 cases of lichen planus of the vulva, which she believes to be often confused with leucoplakia vulvæ—a much more serious affection in that it not infrequently terminates in epithelioma, which the former never does. This contention, which she supports on clinical and microscopical grounds, may safely be left to the examination of her dermatological readers; but she is undoubtedly right in saying that the diagnosis of leucoplakia vulvæ—like the diagnosis of leukoplakia in the mouth—is used too loosely by the profession generally. Nevertheless we might err in caution if we went the whole way with Dr. Hunt. We very much doubt if she will obtain credence for her findings that out of 300 cases of pruritus vulvæ no less than 105 (i.e., over a third) were due to, or associated with, lichen planus. This is certainly not

¹ Alcohol in Hospital Practice. By Courtenay C. Weeks, M.R.C.S., L.R.C.P., Director and Medical Lecturer, the National Temperance League. London: National Temperance League, 1935. Pp. 35. 9*d.*

¹ Sollmann, T., and Schreiber, N. E.: Arch. Internal Med. 1936, lvi, 46.

² Brit. Jour. Derm. and Syph., February, 1936, p. 53.

the ordinary experience of dermatologists either in this country or abroad, and we take leave further to doubt her claim, or that of any other physician, to be able to establish the cause with certainty in 297 out of 300 cases of a disorder which is one of the most puzzling of cutaneous syndromes. Many clinicians may also find it difficult to believe that only one case of ringworm was present in so large a series, and they may be further perplexed by the omission of a menopausal or endocrine variety of pruritus which is widely recognised as common. In other respects, however, Dr. Hunt will find sympathetic support for her views. There is certainly an undesirable tendency to resort to surgical remedies, which are rarely successful and mostly mutilating. With the exception of nerve section, they should be reserved for cases of a frankly malignant type, or those regarded as pre-malignant on microscopical examination. On the medical side, too, there is probably far too much prescribing of local and general sedatives. Not a few of these unfortunate women have become chronic morphine addicts, and it should not be forgotten that cocaine and its substitutes soon lose their anæsthetic properties and sometimes become an important factor in the protraction of the disease.

INVESTIGATION OF URTICARIA

FASHIONS pass; booms turn into depressions. And less is nowadays heard of wild hopes that "allergy" will prove to be the solution of most of the remaining problems of medicine. To force an allergic explanation upon an obscure disorder will often make it retreat further into obscurity. At the same time there are few more fascinating diseases than those which are generally interpreted in terms of sensitisation—for example, urticaria—and there must be revelations about them waiting for us round a corner. At present we are mainly at the stage of observation and experiment, the one often leading to the other. Thus the discovery of sensitisation to chloramine causing spasmodic rhinorrhœa, urticaria, and eczema has led Salén¹ to test the chloramine sensitiveness not only of this particular patient, but also of a number of other veterinary students. To explain the positive skin reactions he found in many showing no clinical manifestation of sensitiveness he concludes that this may be a process normally evoked in most people by adequate exposure to an antigen. The clinical manifestations of such sensitisation may only occur, however, in those with an inherited predisposition to such reactions. In other words, a positive skin test and presumed sensitisation merely indicate adequate contact and do not imply liability to allergic reactions. It does indeed look as though some such explanation must be invoked to explain the unreliability of cutaneous tests, but it is possible that some unrecognised factor in the local mechanism of the test reactions, quite independent of general considerations, is responsible for these inconsistencies. In practice we can no longer suppose that every case of urticaria will be elucidated by conscientious skin-testing against all possible inhaled, ingested, or contact allergens, and the patient's problem has still to be viewed upon a broad medical basis. Particularly in cases of simple factitious urticaria, in urticaria following exertion, and in that provoked by exposure to cold is it difficult to determine the ætiology and institute rational therapy. Thus Levine,² who has lately given a full report of a case of urticaria due to cold, has been unable to draw any positive

conclusions about ætiology; and it seems doubtful whether the state is any more than an exaggeration of the normal physiological response.

LEPROSY IN THE EMPIRE

LAST Tuesday's meeting at the India Office produced many striking statements from the principal speakers. As chairman of executive of the British Empire Leprosy Relief Association¹ Sir Edward Gait said that the number of lepers in the Empire was now put at at least two million. Sir Leonard Rogers, F.R.S., spoke of his belief that if infection in childhood could be prevented the disease would almost die out within a couple of generations, and the same argument was brought out by Dr. E. Muir, formerly of the Calcutta School of Medicine, who has succeeded Dr. Thomas Cochrane as the Association's medical secretary. Leprosy, he said, like tuberculosis belongs to a certain stage in the life-history of a nation. Here in England we rose above that level in the fourteenth and fifteenth centuries, just as we are now gradually rising above the rather higher level of tuberculosis. The campaign against leprosy among backward races must have in its forefront the amelioration of their social and economic conditions. The problem was largely a child problem because children are more prone than adults to infection and develop an active form which spreads infection. So far there was no specific remedy, though "we have a form of treatment which under favourable circumstances will heal the less virulent cases." Compulsory isolation of infectious cases would never succeed among vast uneducated populations, for it drove the disease underground. But, as in many other departments of medicine and social science, much could at once be accomplished if we would only put into effective use the knowledge already acquired. The chief difficulty, in Dr. Muir's opinion, is the ignorance and indifference of people at home. In this country we are at present secure against many of the diseases which ravage our colonies and dependencies, and "with this feeling of security people have very little idea of the difficulties and problems with which governments, missionaries, and others are struggling in those distant lands for which we have taken upon us the responsibility." Funds would pour in, as Sir Leonard Rogers said, if leprosy were as prevalent in Europe now as it was five hundred years ago:

ON March 17th and 19th at 5 P.M. Dr. John Parkinson will deliver the Lumleian lectures to the Royal College of Physicians of London, his subject being enlargement of the heart. Medical practitioners will be admitted on presentation of their card.

OUR news columns this week contain an advance notice of the Second International Congress of the Scientific and Social Campaign against Cancer, which is to be held in Brussels next September, under the auspices of the International Union against Cancer.

Sir Gowland Hopkins, O.M., professor of biochemistry at Cambridge, has been appointed to the faculty of Harvard University for the academic year beginning next September and will deliver three lectures in the Harvard medical school as Edward K. Dunham annual lecturer. The Dunham foundation is designed to promote understanding between students and investigators in the United States and other countries.

¹ Salén, E. B.: *Acta Med. Scand.*, 1935, lxxxvi., 486.

² Levine, H. D.: *Arch. Internal Med.*, 1935, lvi., 498.

¹ The annual report for 1935, just issued, may be had from the association at 131, Baker-street, London, W.1.

PROGNOSIS

A Series of Signed Articles contributed by invitation

XCII.—PROGNOSIS IN CARCINOMA OF THE COLON

THE precision of diagnosis by a competent observer using adequate radiological equipment is now such that no carcinoma of the colon submitted to examination by X rays can escape detection. Its site and outline can be demonstrated, and the mobility of the affected segment of colon can be determined. The demonstration is simple when suspicion of the presence of a carcinoma has been aroused, but unfortunately the absence of symptoms in the early stages of most cases of malignant disease of the large bowel makes diagnosis dependent on obstruction. The cases in which a diagnosis is reached before obstruction has occurred are limited to those in which a growth is found in the course of an operation or an X ray examination initiated for the correction or detection of some other disease.

Study of the natural history of carcinoma of the colon shows that from one to two years elapse between the first appearance of the growth and the first attack of obstruction. During that period of progressive diminution in the calibre of the bowel, the mechanism of compensatory hypertrophy of its muscular coat is so efficient that the patient may and frequently does feel no impairment of his normal health sufficient to take him to his doctor. But during this clinically silent period of growth, metastasis to lymph glands often curtails the prospects of survival. Prognosis after removal of a carcinoma from any part of the body is conditioned chiefly by the presence or absence of metastasis at the time of operation, and this principle is as rigidly determined for the colon as for the breast.

TYPE OF GROWTH

The common pathological type of carcinoma in the large bowel is a localised growth of scirrhous habit, which spreads slowly round the circumference of the gut to form a ring stricture. It affects chiefly the left half of the colon and produces an obstruction which often antedates metastasis by a sufficient margin to make radical removal successful, as success is estimated in the surgery of malignant disease. In the right half of the colon, carcinoma tends to be more bulky than in the left half and to be less rapid in the destruction of its host. The bulky tumour which fungates into the lumen of the bowel is often characterised by so much ulceration and sloughing of its mucous surface that an adequate though irregular passage for the intestinal contents is maintained. On account of this tendency to ulceration and of the fluid nature of the content of the proximal colon, the onset of obstruction may be delayed and the first symptoms to attract the patient's attention may be weakness caused by loss of blood and toxic absorption from the ulcerating surface, or pain associated with infiltration of surrounding tissues by the tumour. Examination of the abdomen at this stage of the disease may reveal a palpable tumour, but if the carcinoma is situated in the hepatic flexure it may be so concealed by the lower ribs and the liver as to escape detection. This point is illustrated by the frequency with which carcinoma of the hepatic flexure remains unsuspected until perforation compels investigation. The splenic flexure, being higher than the hepatic, is even less accessible to palpation, but its characteristic pathological type

of carcinoma is the ring stricture and, as a clinically recognisable obstruction usually antedates glandular metastasis, the outlook for the patient is considerably better. The most favourable type of carcinoma of the colon is the one which produces obstruction at an early stage of its development, whether because it grows at the ileo-colic junction where the lumen is narrow or because its polypoid shape provides an adequate stimulus to the formation of an intussusception.

SITE

The influence of the anatomical site of an operable carcinoma of the colon on prognosis is forcibly demonstrated by the ease with which resection can be performed in those parts of the bowel which are provided with a mesentery. Removal of a growth of a transverse or of the pelvic colon is much simpler than is resection of the fixed parts of the colon, whether the patient's condition allows of primary reconstitution of the continuity of the bowel or necessitates a two-stage operation of the Paul type. Provided that the removal be adequate, the easier the operation the lower the mortality.

SYMPTOMS AND SIGNS

The value to the patient of an attack of acute obstruction, lasting perhaps for 48 hours, at a relatively early stage in the evolution of his disease can scarcely be over-estimated; nor can the value of recognition by his doctor of the potential significance of such an incident in a middle-aged man or woman. The second attack may not come for several months, during which the growth will progress and may spread to lymph glands, and during which the general health will deteriorate as the result of toxic absorption from the chronically obstructed bowel. Wasting is seldom a feature of the disease. Obesity is probably as common among the subjects of carcinoma of the colon as among healthy people of the same age. It increases the risk of operation, not only because the stout often tolerate severe abdominal operations badly, but also because of the technical difficulties imposed by a short, fat-loaded mesocolon.

In the absence of demonstrable metastases, a rational prognosis can only be founded on the data provided by exploration of the abdomen. When the operation is performed in the absence of acute obstruction there will have been ample opportunity for a complete investigation beforehand. The exact site, approximate local extent and mobility of the growth will be known, so that those precious commodities, time and manipulation, can be devoted to the constructive phases of the operation where absence or limitation of metastasis encourages removal of the growth.

IMMEDIATE RISK OF A RESECTION

In assessing the immediate risk of a resection the preoperative preparation of the patient must be allotted a value comparable with our estimate of the adequacy of his cardiovascular and respiratory mechanism, and of his renal sufficiency. Preparation for operation should include not only attention to the alimentary canal but also the raising of the hæmoglobin content of the blood by the necessary number of transfusions to at least 80 per cent. Only in the most favourable circumstances can the patient expect to escape with a single operation, and in the practice of many surgeons the possibility is limited

to growths of the right half of the colon from the cæcum to the middle of the transverse colon. Even then a temporary opening to prevent a rise of gaseous pressure within the bowel is often advisable. In other cases, more than one operation will usually be required in the interests of safety, a short circuit or colostomy preceding the removal of the tumour. A third operation may be necessary to close the colostomy.

IMMEDIATE OUTLOOK IN ACUTE OBSTRUCTION

The immediate outlook for a patient who is first seen in a state of absolute intestinal obstruction depends on such general factors as age and preceding physical condition, and on the number of days during which obstruction has been absolute. When the growth is in the ascending colon the clinical picture is often dominated by the participation of the small intestine and vomiting may be severe, but with obstruction of the more distal parts of the colon distension is the chief feature and vomiting is late and capricious in its incidence. The pulse-rate may rise scarcely at all for the first four days. Within these limits an attack of obstruction does little to jeopardise the success of the ultimate resection provided that the bowel on the proximal side is drained for an adequate time before removal of the growth is attempted. In this connexion it is necessary to recognise that a cæcostomy cannot be relied upon to drain the colon distal to the hepatic flexure, and that Paul's operation, where suitable, is by far the safest way out of an attack of obstruction.

REMOTE PROGNOSIS

A prognosis founded on the relative completeness of a resection must take into account the information afforded by naked-eye and microscopic examination of the tissues removed. The length of colon on either side of the growth is always ample provided that its mucous membrane is healthy, but mere length can only guarantee a margin beyond the zone of submucous infiltration, and if polypi are found on the mucous membrane it is likely that others will have been left in the patient and these will carry a slight but definite risk of malignant change. Of far greater importance is the presence or absence of growth in the lymph glands which will have been removed in continuity with the resected bowel. These glands may be enlarged either by growth or by inflammatory changes resulting from absorption of infection from a malignant ulcer. If, on microscopic examination, they are found to contain deposits of carcinoma, the expectation of life will be greatly diminished.

An operation which achieves adequate removal of the carcinoma as judged by the standards of the pathologist may be expected to yield from four to eight years of freedom from recurrence, growths of the right half of the colon giving a more favourable outlook than those of the left half. On account of the damage produced by an attack of obstruction and the greater liability to post-operative complications which it involves, and by reason of the number and often the severity of the necessary operations, restoration to health is usually slow. Full vigour may be regained or the patient may be hampered by minor degrees of obstruction caused by adhesions.

RECURRENCE

Recurrence is limited to the abdominal cavity and produces intestinal obstruction or enlargement of the liver. These two clinical features may coincide and either may be accompanied by ascites. When

recurrence takes the form of intestinal obstruction accompanied by gradually increasing distension of the abdomen and by the presence of palpable masses, it is unlikely that further operation will be justified either by prolongation of life or by relief of suffering. The problem presented by recurrence of intestinal obstruction without a palpable abdominal tumour or with a single lump, especially if this is localised to the pelvis, demands a fresh investigation by the same methods as in the case of the primary tumour. Prognosis is again dependent on the pathological conditions found at operation. A single recurrent growth in either small or large bowel or in one or both ovaries with an adherent coil of intestine may be amenable to excision with a prospect of two or three years of useful life. In less favourable cases a short circuit or a colostomy may prolong life and reduce suffering for several months, though the patient is unlikely to regain more than a relative degree of health and activity.

E. K. MARTIN, M.S., F.R.C.S.,
Surgeon, University College Hospital.

OUR issue of August 10th contained the last of the articles collected in book form and issued as "Prognosis," Vol. I. (10s. 6d.). The subjects dealt with week by week in this series since that date are as follows:—

Congenital Stenosis of the Pylorus, by Miss Gertrude Herzfeld and Dr. H. L. Wallace. Fractures of the Bodies of the Vertebrae, by Mr. H. Ernest Griffiths. Malocclusion of the Teeth, by Mr. A. T. Pitts. Fibroids, by Mr. Victor Bonney. Jejunal Ulcer, by Dr. R. P. Picton Davies. Foreign Bodies in the Air and Upper Food Passages, by Mr. V. E. Negus. Papilloma of the Bladder, by Mr. Cyril A. R. Nitch. Cerebro-spinal Fever, by Dr. C. Worster-Drought. Non-malignant Diseases of the Breast, by Mr. Eric Pearce Gould. Tetanus, by Dr. Leslie Cole. Gastric and Duodenal Ulcer, by Dr. J. J. Conybeare. Middle-ear Suppuration, by Mr. Walter Howarth. Caesarean Section, by Mr. Eardley Holland. Ulcerative Colitis, by Dr. A. F. Hurst. Internal Derangement of the Knee-joint, by Mr. R. C. Elmslie. Pituitary Tumours, by Mr. Hugh Cairns. Malignant Growths of the Testicle, by Mr. Kenneth M. Walker. Tuberculous Infections of the Skin, by Dr. Henry C. Semon. Trigeminal Tic, by Dr. Wilfred Harris. Chronic Bronchitis and Emphysema, by Dr. R. A. Young. Deafness, by Mr. Harold Barwell. Asthma, by Prof. L. J. Witts. Hemiplegia in Middle Life, by Dr. Neill Hobhouse. Fractures of the Upper End of the Femur, by Mr. George F. Stebbing. Enlargement of the Spleen, by Dr. J. W. McNee. Congenital Syphilis, by Dr. David Nabarro. Spinal Caries, by Sir Henry Gauvain.

KING EDWARD'S HOSPITAL FUND FOR LONDON.—Hospitals situated within 11 miles of St. Paul's which want to participate in the grants made by this Fund for the year 1936 should apply before March 31st to the hon. secretaries of the Fund at 10, Old Jewry, E.C.2. Applications will also be considered from convalescent homes which are situated within the above area or which, being situated outside, take a large proportion of patients from London.

GLASGOW ROYAL MATERNITY AND WOMEN'S HOSPITAL.—At the annual meeting of contributors and subscribers to this hospital it was pointed out that increasing use was being made of the antenatal department. During the past year, 1600 cases, or 35 per cent. of all those admitted to the hospital, attended the antenatal dispensary, the total attendances being 16,572. No fewer than 68 per cent. of the total admissions were abnormal, and the need for extending a part of the hospital was being felt.

SPECIAL ARTICLES

MEDICAL RESEARCH COUNCIL
ANNUAL REPORT FOR 1934-35

THE Introduction to the report of the Medical Research Council provides year by year in 30 brief pages an index, a record, and a forecast: an index to the trend of medical research during the period under review; a record of results achieved to the date of its close; and a forecast, often already confirmed in the intervening six months, of the conclusions reached as the outcome of work essentially complete but not yet published. It is a peculiar merit of this annual report to steer between the policy, unfair to other workers in the same field, of staking out claims for discoveries of which full details are not available and that of supplying a mere summary of communications already familiar to the readers of scientific periodicals.

This year a dozen subjects from among those on which work has been actively pursued are selected for review. Pride of place is given to

Nutrition: Application of Modern Knowledge

There have been many recent indications of greater public interest in nutrition. Though this interest may have been aroused not solely nor even primarily because of the intrinsic practical importance of proper feeding in its relation to health, but largely because of the probable economic effects on agriculture and industry, the Council express satisfaction that the discoveries of their own and other investigators of nutritional problems are likely in the near future to play their due part in advancing human welfare.

HISTORICAL SURVEY

In view of this change in attitude they enumerate some of the more practical discoveries which they have assisted during the 20 years of their existence.

In the first year of their work they initiated research on rickets which led to the elucidation of its nutritional aetiology, and in particular to the discovery of a calcifying vitamin (vitamin D), a substance which was ultimately prepared in its pure form by workers at the National Institute for Medical Research. They also promoted, in association with the Lister Institute, clinical investigations on rachitic children at Vienna, which confirmed the laboratory investigations and placed the methods for the prevention and cure of the disease on a firm basis. Later they supported work, arising from the rickets investigations, as a result of which it is now practicable to improve greatly the structure of the teeth of the rising generation by proper feeding in infancy and childhood. They are also responsible for the clinical investigations which demonstrated that, apart from dental structure, decay of the teeth can be slowed down by diet. This work has led to a new outlook on what is probably the commonest disability of civilised man—namely, dental decay—and has supplied facts ready and feasible for widespread translation into practice.

One of the most important practical investigations initiated by the Council demonstrated the effects of supplementing the diet of growing children with milk and other substances. Through their Accessory Food Factors Committee the Council have initiated and financially supported investigations made with the object of standardising the different vitamins. Vitamin D was first standardised in this country, and the whole series of investigations later made it possible for international conferences, convened by the Health Organisation of the League of Nations in 1931 and 1934, to establish international standards and units for vitamins A, B₁, C, and D. Thus people throughout the world can now discuss these

vitamins in terms of units, in the same way as they can discuss time and distance in units of hours and metres.

Other inquiries supported by the Council called attention to the high incidence and significance of anæmia both in pregnant and lactating women and in their infants in this country, and showed how the condition could be avoided or mitigated. Certain nutritional investigations have been directed to the study of goitre, and others have had as their object the determination and close analysis of the usual dietaries of different sections of the community.

These are only a few of the more important contributions to knowledge in nutrition for which the Council have been responsible. Throughout their existence they have realised the fundamental importance of this rapidly developing subject, and have placed it in the foreground of their programme.

THE NEW TEACHINGS

It is fortunate that the essential teachings can be reduced to a few simple statements. The first is that the younger the child the more essential is correct feeding for proper growth and health. It is thus necessary to apply the new teachings of nutrition to the case of the pregnant and lactating mother; and, despite the great importance of improvement in the dietary of school-children, proper feeding of the infant and child of pre-school age is an even greater need. Breast feeding is of even higher value than has been previously believed, and ought to be more extensively adopted and continued for longer periods.

On the dietary side, the broad requirements can be simply stated to the public—without mention of calories, vitamins, or other technicalities necessary to the investigator—by saying that much more milk ("safe" milk), cheese, butter, eggs (especially egg-yolk), and vegetables (especially green vegetables) ought to be consumed. In particular, milk ought to be the chief drink for children, and especially in the first years, while bread and other cereals should in these early years be greatly reduced.

CURRENT WORK

Prof. E. P. Cathcart and Mrs. A. M. T. Murray have completed the analysis of data on family diets collected from various towns in Great Britain over a period of years, particular attention being given to the iron, calcium, and phosphorus contents of the diets. A quantitative survey of the diets of crofters and others in remote Highland areas is contemplated for purposes of comparison.

A quantitative study of the ordinary diets of 120 men and women has been completed by Miss E. M. Widdowson, working under Dr. R. A. McCance, who with Dr. L. R. B. Shackleton has also continued his observations on the chemical composition of fruits and vegetables and their losses in cooking. It appears that most of the iron of vegetables and bread, and little of the iron of meat are utilised in human nutrition, and that about half the phosphorus of cereals, nuts, and pulses is in a form which cannot be absorbed.

Prof. S. J. Cowell has done further experiments on the factors controlling the excretion of calcium in the intestine. It appears that the rate of excretion depends on the degree of saturation of the tissues generally with calcium, but that it is not much affected by sudden variations in the calcium content of the blood. Miss E. M. Hume, assisted by Mrs. I. Smedley MacLean, D.Sc., have made further observations on the effects of fat deficiency which were noted by Burr and Burr in rats. Experiments are

in progress to determine what substances in lard and linseed oil are responsible for curing the lesions produced and for restoring the rate of growth to normal. An inquiry is also being made into the influence of the fats in the diet on reproduction. Under the general direction of Prof. W. W. C. Topley and Prof. Cathcart, Dr. Marion Watson has obtained preliminary results which indicate that diet and various environmental factors have specific effects on the fertility, growth, and survival-rates of young mice. Attempts are now being made to determine whether it is possible by dietetic means to increase the resistance to *Bact. aertrycke*.

Dr. Helen Mackay is examining the value of a soya bean preparation as a supplement to milk in the diet of infants. The iron content of the bean is comparatively high, and it is thought that it may possibly replace inorganic iron salts for the prevention and treatment of nutritional anæmia. An inquiry at the North Eastern Hospital, Tottenham, showed that the addition of extra rations of vitamins A and D to the diets of children with measles was without effect on the course of this disease or on the incidence of the minor skin infections.

The method devised by Mr. C. O. Harvey to measure minute quantities of iodine in biological substances has been used by Miss M. G. Crabtree to study the iodine content of samples of milk, pasture, and drinking water from different parts of England with the idea of obtaining definite proof whether the incidence of goitre in certain districts is actually related to the iodine-content of the local milk and water supplies. The findings so far indicate that the iodine-content of milk from the non-goitrous districts of Suffolk is higher than of that from the goitrous districts of Somerset.

VITAMIN STUDIES

The seven pages devoted to vitamin studies in this year's report record much work on various components of the vitamin-B complex, and on vitamin C (ascorbic acid) with short sections on the chemistry of vitamin E and notes on the storage and on the standardisation of vitamin A.

As part of an inquiry into the vitamin B₁ content of human diets Mr. P. C. Leong has measured the amounts of this vitamin present in genuine wholemeal wheat and in ordinary brown bread and has found the difference between them to be surprisingly small. By arrangement with physicians at several hospitals trials are being made of the therapeutic effects of vitamin-B concentrates in "pink disease" in children; encouraging results have been obtained in a few cases, although caution is required in their interpretation.

Application of the work of Mr. L. J. Harris, Sc.D., and Mr. S. N. Ray, Ph.D., on the diagnosis of vitamin-C deficiency to children under the care of Prof. L. G. Parsons and of Dr. E. Pritchard suggests that a suboptimal intake of vitamin C is common in artificially fed infants but not in breast-fed ones, human milk being three or four times richer in this vitamin than cow's milk. Observations on adults by Dr. M. A. Abbasy and Dr. Harris indicate that one or two oranges a day suffice rapidly to bring reserves of vitamin C up to normal in persons whose diet has been deficient in this respect, but there is evidence that mothers often disobey instructions to give orange juice regularly to their infants.

The only mention of work on vitamin D in this section of the report is on that of Miss Fischmann, who is studying its influence on ossification in tissue cultures. Elsewhere (p. 137) reference is made to the observations of Prof. J. B. Duguid, assisted by Dr. M. R. P. Williams, on the experimental production of a form of nephritis by giving large quantities of orthophosphates by mouth, in the presence of hypervitaminosis D; and (p. 110) to the study by Dr. Dorothy Russell of the vascular, renal, and pituitary changes found in this condition.

Examples of Combined Clinical and Laboratory Research

Ergot in childbirth: isolation of ergometrine.—The end of the fascinating story, extending over 30 years, of the struggle to reconcile clinical and pharmacological experience in respect to the activity of various preparations and derivatives of ergot is here recalled.

Again and again, during this period, new constituents have been isolated from ergot which, although of great physiological interest, failed to replace in the confidence of the practising doctor the watery extracts of the whole drug. He continued to rely, for the purpose of stimulating contractions of the uterus, on these extracts given by the mouth, though he was assured that they contained none of the alkaloids found to be pharmacologically active when injected. This discrepancy between clinical practice and pharmacological evidence lasted till 1932 when Dr. Chassar Moir was able to demonstrate by objective records the powerful contractions of the human uterus induced by the popular watery extract of ergot. Close co-operation between the late Mr. W. H. Dudley, D.Sc., working on the chemical side, and Dr. Moir enabled them jointly to announce in March, 1935, the discovery of ergometrine as the substance in ergot responsible for the most familiar of the actions of ergot.

The Council point out that these researches, while illustrating how results of equal or even greater importance may be attained by the laboratory as by-products of the chase, also illustrate how vital to the solution of a problem, originating in and concerning clinical practice, may be the guidance provided by continued investigation upon the clinical material itself.

The curative agent of pernicious anæmia.—Another example of the need for continuous clinical guidance is in the testing of the therapeutic activity of preparations derived from liver. It is as yet impossible to foretell whether any particular preparation will be active until it has been tested on patients suffering from pernicious anæmia. No effective laboratory test of activity has yet been established, in spite of world-wide endeavours, while the chemical complexity of the liver principle has prevented the discovery of any chemical or physical property which can be regarded as a measure of its therapeutic influence. The Council were able to organise last year clinical trials by Prof. Stanley Davidson, Prof. E. J. Wayne, and Dr. C. C. Ungley of a preparation of liver extract made by a British firm according to the method of Dakin and West, published in America; the result of these trials (published in *THE LANCET*, Feb. 15th, 1936, p. 349) demonstrated the extremely high degree of potency of this preparation. Injections of from 0.1 to 0.2 gramme of it once weekly, brought about a large increase in the red blood corpuscles of the patients tested and in the course of a few weeks restored them to health.

Prevention of child-bed fever.—Here also the combination of clinical and laboratory research has been effective.

The fact that the morbid agent known to be responsible for puerperal sepsis is a streptococcus characterised by ability to hæmolyse red blood corpuscles has of recent years been supplemented by the knowledge that the cocci having this property comprise several groups and sub-groups, of which only certain members are harmful to human beings. It emerges moreover that the hæmolytic streptococci occasionally found in the genital tract of healthy parturient women are not, as was formerly supposed, identical with those causing puerperal fever, which latter come from some outside source. Dr. Dova Colebrooke has recently tracked down the probable sources of infection. She has confirmed the view that the strep-

tococci of the respiratory tract bear an intimate relation to puerperal fever; and her results suggest that the respiratory tract of the mother must be taken into account as well as that of her attendants, and that familial sources of infection may also be looked for.

Arising from her work is the lesson that it is dangerous for any person suffering from an acute infection of this tract to engage in maternity work, and that maternity and surgical cases should not be treated under the same roof unless the nursing staffs can be kept separate.

Standards for sex hormones.—Under this heading the Council urge medical men using sex hormones in their work to insist on knowing the exact nature and strength of the preparations supplied. The market is flooded with different preparations, and each manufacturing firm has given a proprietary name to its own particular product. While some of these proprietary preparations are good, both their composition and activity being controlled, others are of a semi-bogus nature. The situation lent itself both to quackery and to ignorant treatment of disease until last year a conference, convened by the Permanent Standards Committee of the Health Section of the League of Nations, met in London under the chairmanship of Sir Henry Dale, and made important decisions in respect of nomenclature and standardisation.

A uniform scientific nomenclature and standard units have been adopted for three important natural substances of which therapeutic preparations are now available. These are: (1) "œstrone," "œstriol," and "œstradiol," the œstrus-producing hormones (the alternative names applying to hydroxy-ketonic, trihydroxy and dihydroxy preparations, respectively); (2) "progesterone," the hormone of the corpus luteum which produces in the female the changes associated with pregnancy and pseudo-pregnancy; and (3) "androsterone," a chemical substance closely related to that responsible for the development of the secondary sex characteristics in the male.

The effectiveness of the proposals must ultimately depend on the attitude of those who use the substances. The Council point out that clinical knowledge of the actions of these sex hormones is still very elementary, and it is certain that they are physiologically potent, often in unexpected directions.

Miscellaneous Inquiries.—Travelling Fellowships

Other studies reviewed editorially by the Council are the researches into the value, effects, and possible dangers of different methods of producing anaesthesia; the artificial cultivation of living tissues; iodine and thyroid disease; industrial pulmonary disease; bed-bug infestation and the toxicity of industrial solvents. We shall have occasion from time to time to comment on some of these and on work in progress at the National Institute for Medical Research, at the clinical research units, and under the external research schemes subsidised by the Council.

Regret is expressed that in consequence of a change in policy of the Rockefeller Foundation, the system of international fellowships is being abandoned in favour of concentration upon a more restricted programme for the promotion of research. The Council had been privileged to award five or six whole-time fellowships every year, of the value of between £350 and £450 each; analyses showed that of the 70 men and women who had completed their tenure of these fellowships 12 are professors, 36 others are engaged full-time, and a further 16 half-time in higher teaching and research. The organisation of a new scheme of the same kind is thus

considered highly desirable. A start has been made in the establishment of one such fellowship by the trustees of the late Lord Leverhulme, and the Council suggest that other potential benefactors have here a great opportunity of performing an important national service.

Mr. Ramsay MacDonald, who as Lord President introduces this year the report of the Committee for Medical Research of the Privy Council, announces that the grant-in-aid provided by Parliament for the expenditure of the Medical Research Council last year amounted to £165,000, compared with £139,000 in each of the three previous years. The increase has made it possible to proceed with plans for new research work which had been temporarily in abeyance and to undertake additional investigations required for the purposes of administrative departments. Prof. J. A. Ryle and Prof. Matthew Stewart have replaced respectively Lord Dawson of Penn and Prof. A. E. Boycott as members of the Council, and the impending retirement of the chairman, Lord Linlithgow on his appointment as Viceroy of India is announced with warm appreciation of his services.

MEDICINE AND THE LAW

A Fatal Dose of Paraldehyde

IN *Strangways-Lesmere v. Clayton and others* Mr. Justice Horridge has refused to hold a district hospital at Weymouth liable for the negligence of its nurses. The negligence consisted of administering 6 ounces of paraldehyde to the plaintiff's wife before an operation in mistake for 6 drachms. The honorary surgeon to the hospital gave instructions to the house surgeon for the patient to have per rectum 6 drachms in 9 ounces of water. The night nurse made a pencilled note of the instructions on the bed-board and handed it to Nurse A when the latter came on duty. The judge accepted the evidence of the day sister and the night sister that this pencilled note, thrown away after the operation, specified 6 drachms and not 6 ounces. It was the duty of Nurse A to administer the drug and of Nurse B to check the quantity. The bottle of paraldehyde was taken from a locked cupboard; the label stated that the dose was $\frac{1}{2}$ to 2 fluid drachms. Nurse A poured out 6 ounces (half the bottle) and mixed it with 9 ounces of water; Nurse B watched her do so. The patient died of heart failure due to an overdose of paraldehyde. Mr. Strangways-Lesmere sued the general committee and trustees of the Weymouth District Hospital and also Nurses A and B. He contended that a hospital was, like any other employer, liable for the negligence of its servants. The test was the power of the governors of the hospital to control the nurses' work. A hospital authority was, he contended, protected in respect of the negligence of its nurses only where the negligence occurred in the course of work demanding professional nursing skill over the performance of which the governing body could have no control whatever. Here, said the plaintiff, the hospital authority had clearly assumed control over the measuring and checking of dangerous drugs by nurses because a hospital regulation had been made which required the sister on duty to check the dose. This regulation appeared not to have been properly published to the staff; it was not known to Nurse A or Nurse B; no precautions had been taken to see that the rule was carried out. On the other hand the hospital authorities argued that their

relationship to the nurses was not that of master and servant when the nurses were preparing patients for operations; the nurses were really carrying out the orders of the surgeon in mixing, checking, and administering the drug—which was work demanding professional training and skill. This argument, based on the well-known decision in *Hillyer v. St. Bartholomew's Hospital*, succeeded. Mr. Justice Horridge agreed that the administration of paraldehyde was a skilled operation: it was true that there was a practice at the hospital that all the administration of dangerous drugs should be checked, but he did not think the hospital authorities undertook to administer the doses themselves: the nurses, in giving the doses, were doing their own work as skilled nurses and not as servants of the hospital authority. The administration of paraldehyde, as in this case, was not a matter of a nurse's routine but one in which a nurse had to use professional skill. It was not work which Nurse A was put in the place of the hospital authorities to do, or work which the authorities intended to do for themselves. The only legal duty on the hospital authorities was to see that the nurses whom they engaged were duly qualified persons. The judge was asked to say that, as there was a practice of the hospital to have the doses of dangerous drugs checked, therefore the hospital was at fault in not putting up a printed notice to that effect. He found, however, no evidence that other hospitals exhibited such notices; the evidence was that checking was a well-known practice in hospitals and that the practice was in operation in the Weymouth Hospital. It followed that no negligence had been established against the hospital, and judgment with costs was given in the hospital's favour.

THE NURSES' LIABILITY

The higher the work of nurses is reckoned as an expert professional performance, the more vulnerable they become in the law courts as a separate target. In the Weymouth case the judge found that there was negligence on the part of Nurse A and Nurse B; the damages had been agreed at £100 (if liability should be established), and judgment was given for this amount with costs against the two nurses. The judge said they would have been negligent even if the night sister had herself made the mistake of writing "6 ounces" on the pencilled note. Nurse A had looked at the bed-card and, if she had been careful, she must have seen that the dose was there stated to be "6 drachms." Both Nurse A and Nurse B ought to have looked at the bed-card in measuring out the dose: in that case they would have seen that it was 6 drachms and not 6 ounces. Nurse A was also negligent because the label on the bottle of paraldehyde gave the ordinary dose by the mouth as $\frac{1}{2}$ to 2 fluid drachms and she admitted that she knew that, when administered per rectum, the quantity would be at the most three times the quantity administered by the mouth, whereas the dose she actually administered was considerably larger than that. It had been argued on behalf of Nurse A that the case was unusual. In 99 cases out of 100 the patient's bed-card should be the nurse's Bible, but here the bed-card was inaccurate in no less than three particulars, and the house surgeon had given instructions which were at variance with the directions on the bed-card. As she had received instructions from the night sister, it could not be said that Nurse A was negligent in not following the bed-card. This argument was largely based on the assumption that the night sister made the mistake of writing "6 ounces" in her pencilled note. As

already stated, the judge rejected this assumption and held the two nurses liable.

SYMBOLS OR METRIC SYSTEM

In the Weymouth Hospital case it was supposed that the nurses had confused the drachm-symbol for the ounce-symbol. A medical witness, invited to explain these signs to the court, said that one had "one twist at the top" and the other had "two twists." Counsel dramatically observed that a human life may depend upon the extra twist. The possibility of error has naturally revived discussion of the advantage of the metric system over the traditional mysteries of the apothecary's script. The *New English Dictionary* shows "oz." to have been adopted from the Italian "oz" or "ōz," a fifteenth-century abbreviation: the line above the letters is the familiar sign of a contraction, the full word being *onza* or in the plural *onze*. In Italian manuscript forms of the abbreviation the letter z had a full tail below and the tail was usually carried in a circle under, round, and over the o so as to form the line of contraction above it. It must also be remembered that the symbol ʒ signified the omission of a final syllable, so that oʒ would mean ounce or ounces. It is said that, when printing was introduced, the ʒ became a z to suit the convenience of a limited fount of type, and that, before this change became general, the symbol oʒ had been slurred by hasty writing into ʒ and the lower weight of the drachma was adapted therefrom as ʒ , with "one twist" instead of two (see *THE LANCET*, 1906, ii., 453). In discussing the *British Pharmacopœia* of 1914 (*THE LANCET*, 1914, ii., 907), reference was made to certain recommendations that the old apothecaries' symbols should be abandoned. The symbol ʒj , it was pointed out, may be used to represent 60 grains and also to represent the fluid drachm; the symbol ʒij to represent 480 grains, sometimes 437.5 grains, and also to represent the fluid ounce. Tradition in the writing of prescriptions, however, dies hard. Nor is that surprising in view of the replies to the question: "Is the metric system used in teaching?" put by the General Medical Council to the teaching bodies in 1929. Four of the London and seven other medical schools gave a frank "no"; the remaining replies were little more than a qualified "no." Liverpool had tried the metric system but discontinued it as the students preferred the imperial. The Aberdeen reply is perhaps the most significant: "Sufficient instruction given to enable students to prescribe in the metric system, but they are told that it offers no advantages as regards safety." If the metric system were in use, human fallibility is such that the decimal point might be inserted in the wrong place with serious results. In the Weymouth case the judge elicited the fact that any competent nurse should be able to distinguish one symbol from another.

Societies Charitable and Uncharitable

In the current number of the *Fight Against Disease* the hon. treasurer of the Research Defence Society writes on the menace to hospitals of "antivivisection" methods and finance. He cites a passage from the *Abolitionist* (the journal of the British Union for the Abolition of Vivisection) which comments on a recent bequest of legacies to the Bristol General Hospital and the Bristol Royal Infirmary on condition that "no experiments on living animals have been carried out in the premises for a period of five years prior to the date of actual payment." The *Abolitionist* observes that the Bristol Royal Infirmary is No. 39

on the list of places registered for vivisection under the 1876 Act, and presumes that the legacy will be withheld; "it would be well," it adds, "if it became customary to bequeath legacies with this condition." This comment naturally moves the treasurer of the Research Defence Society to remark upon the persistent attempts of antivivisectionist bodies to divert subscriptions from hospitals merely because the hospital necessarily includes on its staff a pathologist licensed to conduct inoculation experiments for diagnostic purposes, on which the early and efficient treatment of patients depends. Such propaganda may reasonably be described as uncharitable—an epithet which invites re-examination of the technical legal classification of antivivisection societies as charities.

Lawyers are aware of a doctrine known as the rule against perpetuities. Ordinary gifts are void if they infringe that rule. The law, however, has more kindness for charities than dislike for perpetuities. Gifts to a charity do not fail even if they exceed the period of time within which ordinary gifts must take effect. Hence it is important to know whether the objects of the gift are, in the eye of the law, charitable or not. The courts have regarded all objects as charitable which are either expressly named in a now repealed statute of Elizabeth or which are deemed to be by analogy within its spirit and meaning. There are plenty of decisions which show that societies for the prevention of cruelty to animals are "charitable." There is at least one decision, *In re Foveaux*, where antivivisectionist objects were held charitable. Mrs. Frances Foveaux left money to her daughter Catherine with a special power of appointing a fund in favour of charity. The daughter by her will appointed legacies of £300 each to three named antivivisection societies, and Mr. Justice Chitty had, in 1895, to say whether the legacies were valid. He began by refusing to enter into, or pronounce any opinion on, the merits of the controversy between the supporters and opponents of the practice of vivisection. The court, he said, stood neutral. Stated broadly, the one side held that the practice, under careful safeguards, although it might inflict some suffering on the lower order of animals, was justifiable and tended to promote the welfare of the human race and also of the lower order of animals in general. This side had in its favour the Act of 1876 under which the Home Office issues licences. On the other hand, said the judge, the antivivisectionists held that the practice was wholly unjustifiable; it was cruel and immoral. He followed the previous decisions which favoured societies for prevention of cruelty to animals. Accepting the principle that all cruelty is degrading, he held that, if a society for preventing cruelty to animals is charitable, then a society for preventing a particular form of cruelty to animals must also be charitable. He was careful to guard against saying that mere infliction of pain was necessarily cruelty; infliction of justifiable pain might not be cruelty. He wound up his judgment by saying that the antivivisection societies with which the case was concerned might be near the borderline, but he thought they were charities.

The Foveaux case has long been followed, but in 1929 its value was a little shaken in the Grove-Grady will case. Here a bequest to found the "Beaumont Animal Benevolent Society," with provisions for a sort of sanctuary where all wild creatures would live free from human interference, was upheld by Mr. Justice Romer as a valid charitable trust. On appeal a strong argument to the contrary was

built up by Mr. Wilfrid Greene, now a Lord Justice. Mr. Greene contended, amongst other things, that, if the court were not satisfied that propaganda and expenditure for the suppression of vivisection were beneficial to the community, they could not be the subject of a charitable trust. The Court of Appeal (Lawrence, L.J., dissenting) held that a trust in perpetuity for animals might be good if in its execution there was necessarily involved a benefit for the community; if no such element were present, the trust would be bad. Lord Justice Russell, one of the majority judges, said he knew of no decision upholding such a trust in favour of animals on any other ground than that the execution of the trust (in the manner defined by the creator of the trust) must produce some benefit to mankind. "I cannot help feeling," he went on, "that in some instances matters have been stretched in favour of charities almost to bursting point." He thought the authorities had reached the farthest admissible point of benevolence to charities in favour of animals; for his part, he was not prepared to go any further. The cases had run to fine distinctions, and, speaking for himself, he doubted whether some of the former decisions would not nowadays go the other way. "For instance, antivivisection societies, which were held to be charities by Chitty, J., in *In re Foveaux* and were described by him as near the borderline, might possibly, in the light of later knowledge in regard to the benefits accruing to mankind from vivisection, be held not to be charitable." Lord Justice Russell referred later to the *Wedgwood* case where a trust in favour of animals was upheld in 1915. He observed that it was not a decision that every trust for the benefit of animals would necessarily involve the benefit of the community, or that a trust for the benefit of animals which involved no benefit to the community would be a charitable trust.

Undoubtedly the law adjusts itself to changes in public feeling and general knowledge. The Chitty judgment in the Foveaux case pointed out that the medieval "dole" charities were no longer to be regarded as beneficial; they tended to pauperise a district and the court might nowadays find itself against them. Old beliefs change. The antivivisection ideas of past generations, still provocatively propagated by the societies, refuse to allow that any experiment on animals can be beneficial. Lord Justice Russell, in the passage already cited, assumes without hesitation the benefits accruing to mankind from vivisection. The recent failure of the Battersea General Hospital, while maintained on uncompromisingly antivivisectionist lines, is further evidence of the change. The hospital frankly admitted that the restrictions prevented it from giving medical treatment in accordance with the best modern standards. It was even confessed that the staff had been infringing the restrictions in the interests of the patients. The antivivisectionist societies still stand for a policy which attacks what is now recognised as beneficial to the community. To this extent their own objects are the reverse of beneficial to the community and will cease to be charitable, in the legal sense, as soon as the courts follow the direction suggested by Lord Justice Russell. It is not too late for the societies to abandon their propaganda against the officially licensed systems of experiments on animals and to concentrate upon other and more admirable forms of animal welfare. The price of remaining charitable for the purpose of exemption from the law against perpetuities is to be less uncharitable in the simpler meaning of the layman.

BUCHAREST

(FROM OUR OWN CORRESPONDENT)

THE HIGH INFANT MORTALITY

INVESTIGATIONS by Prof. Mezinescu, of the University of Bucharest, revealed a disconcerting rise in the infant mortality in the last decade. In Rumania 50 per cent., that is 12,000 infants, die during the first year, and of the remainder only half reach the fifth year. Not only are our figures higher than any in Europe, says Mezinescu, but what is more sad, the mortality is no lower now than it was fifty years ago. The situation is not much better in the towns than in the villages; the rate is highest in Bessarabia and lowest in the province of Ilfov, containing Bucharest. He drew the attention of the government to the fact that large districts with twenty or twenty-five villages have only one doctor, who is quite unable to treat all the children in the epidemics. There should not be more than ten villages to a district, he said, and there should be a good salary to attract medical men, because the ordinary income from private practice is negligible on account of the great poverty of the rural population.

RECOGNITION OF FOREIGN DIPLOMAS

In the years 1924-34 no less than 1261 foreign diplomates have had official recognition in Rumania. As a rule, said Dr. Peter Stroescu at the annual general meeting of the National Medical Association, such recognition violated the principles of law and of national pride. Some of the diplomas may be acceptable, but most have been obtained with a much shorter period of study than that demanded in the Rumanian universities, and some do not qualify their owners for medical practice even in the country of issue. It is noteworthy, he said, that these diplomas are granted not by the important centres but by small universities which are almost unknown in the scientific world. Another abuse is the permission given to physicians who cannot produce their original documents and licences as evidence of qualification. Having failed in practice after many years in another country, they do not meet any difficulty when they decide to settle in Rumania. These faults, Dr. Stroescu said, need active and urgent remedy, and all the regulations for recognising foreign diplomas must be revised; all who cannot produce original certificates within a certain period should be prohibited from practising. He proposed a rigorous investigation before granting recognition and that a comprehensive examination should be passed. These reforms should also be extended to the registration of dental practitioners. Dr. Tetul, of the University of Bucharest, has said that the foreign diplomas are obtained mainly by Bessarabian Jews and Magyars, and Dr. Danica asked that regulations should be introduced governing the proportion of the different races in medical practice and that the Association should demand that all foreign diplomas should no longer be recognised.

TAXATION OF COSMETICS

A new Act imposes a 10 per cent. ad valorem duty on all cosmetics, even if they contain official drugs. The duty is to be paid in stamps attached to the wrapper in such a way that they are torn in opening the packet. As the list includes hair lotions containing quinine, sulphur, or resorcin; powders containing salicylates and zinc oxide; ointments with ichthyol and mercury; and bath salts with medicinal

properties, a protest meeting was called by the National Medical Association. This will probably result in the withdrawal of these preparations from the list, confining the tax to those that are purely cosmetic.

B C G VACCINATION IN RUMANIA

In spite of all objections, B C G vaccination is considered indispensable by an ever-increasing majority of pædiatricians. This attitude is supported by several articles recently published in this country, among them one by Bradiceanu, who favours intracutaneous injections of the vaccine. The criticisms made are that vaccination is ineffective and that it is harmful. In reply Bradiceanu blames the first on lack of absorption, because so many children vomit the material when it is given by mouth, and he thinks that the intracutaneous method introduced by Wallgren will solve the problem. The principal aim is to attain a relative immunity especially against the primary infection, but the infant has to be guarded for at least two months against every kind of tuberculous contact, and vaccination will not protect him from massive or constant invasions. As to its being harmful, Bradiceanu says that no one has yet proved that the attenuated organism of B C G can regain its virulence; in the absence of reliable statistics, the significance of the slow growth and gastro-intestinal disturbances of vaccinated children cannot be judged.

IRELAND

(FROM OUR OWN CORRESPONDENT)

NATIONAL HEALTH INSURANCE IN THE IRISH FREE STATE

THE committee stage of an amending Bill to the National Health Insurance Acts gave an opportunity in the Dáil last week to draw attention to a peculiar feature of the administration of national health insurance in the Irish Free State. It is that in such administration neither in the central authority of the Controller's office nor in the office of the Unified Society is there a single medical man employed, nor is there any machinery by which medical opinion or medical knowledge is brought to bear on the work of insurance. The Bill before the Dáil was one dealing with the management of the Unified Society which a few years ago replaced the numerous approved societies. An amendment was brought forward to provide that there should be one medical practitioner, to be appointed by the Minister, as a member of the committee of management of the Unified Society. At the end of the discussion the Minister promised to consider the matter and the amendment was withdrawn. When national health insurance was first established in Ireland in 1912 the central authority was a commission of which one of the four members was bound by statute to be a medical practitioner. On the staff of the commission were two medical inspectors. Nearly all the approved societies had medical advisers of their own. Some ten years ago the commission appointed three medical referees to assist them in deciding as to entitlement to sickness or disablement, but these gentlemen have no share in or influence on administration. The commission was abolished some years ago, and as vacancies occurred in the post of medical inspector no fresh appointments were made. The Unified Society, in

(Continued at foot of opposite page)

PANEL AND CONTRACT PRACTICE

Two Successful Appeals on Specialist Service

AN insurance practitioner has appealed with success against two decisions of the Surrey insurance committee. Both cases related to operations—removal of the appendix and removal of a twisted ovarian cyst—performed at a hospital outside the area of the doctor's insurance practice upon insured patients.

CASE ONE

In the first case an attempt having failed to secure a bed in a local hospital arrangements were made for the patient's admission to another hospital some distance away. The practitioner, before operating, made it clear to the patient that the operation was outside the scope of medical benefit and that there would be a fee of five guineas, and a further guinea for the anaesthetist. The fees were paid and the patient then applied to the H.S.A. for assistance which was not available. The doctor advised the insured person to apply to his society, but the man wrote to the insurance committee and correspondence between the committee, the doctor, and the patient ensued. The doctor was told by the clerk of the committee that he should have submitted form G.P. 45 to the committee within two days of the date on which treatment was given. The clerk's letter was mislaid and the doctor had to ask for a copy, promising his observations upon the receipt of the copy. He added that it had occurred to him that as the hospital was outside the area of his practice the patient would have no right to call on his services there, and the question whether appendicectomy was within the scope of medical benefit or not would be immaterial.

The clerk's reply indicated that the correspondence had been submitted to the medical benefit subcommittee, that he had been instructed to state that it would appear that the submission of the account to the patient constituted a breach of the terms of service, and went on to ask the doctor to send a cheque for six guineas so that a similar amount might be sent to the patient. The doctor objected that the subcommittee had found him guilty of a breach of the terms of service without receiving any statement from him. He reiterated that he had informed the patient that the operation was not within the scope of medical benefit, and that he had filled in form G.P. 45 on his return home from performing the operation, and to the best of his knowledge and belief posted it. In due course the medical service subcommittee heard the case and took the view that the form G.P. 45 had not been posted; they recorded the opinion that the fee paid by the patient was returnable to him. The insurance committee adopted the recommendation that the terms of service had not been complied with, and that the sum of six guineas should be deducted from the practitioner's remuneration and be refunded to the insured person.

The doctor appealed to the Minister, basing his case mainly on the form of the inquiry and, as the persons appointed to hear the appeal were not impressed that aspect need not be particularised. But their report, commenting upon the fact that the

doctor did not raise any question regarding the form of the resolution passed by the committee, expresses the view that the Minister could and should do so. Under Article 34 of the Regulations a committee can recover from a practitioner expenses reasonably and necessarily incurred by an insured person owing to the practitioner's failure or neglect to comply with the terms of service, and can repay to the insured person the sum so recovered. But the liability for the fees had been incurred, not by reason of any default on the doctor's part but by reason of a contract voluntarily entered into by the parties, a contract which did not in any way conflict with the doctor's duties under the terms of service. On legal grounds therefore they recommended that the appeal should be allowed. The view of the referees on the merits of the insurance committee's decision may be given in their own words:

"In the first place it will be noted that the decision was to withhold £6 6s., a sum which comprises the anaesthetist's fee of £1 1s. Now it was not suggested that Dr. A. had previously been remiss in sending forms G.P. 45. In fact the evidence led us to suppose that this was the first occasion on which he had charged for an operation on an insured person. Yet, for overlooking the necessity for submitting form G.P. 45, or possibly for merely forgetting to post the form when filled up, the insurance committee propose not only to deprive the doctor of his fee, but also to make him pay out of his own pocket the anaesthetist's fee.

"To our mind such a penalty is out of proportion to the offence."

CASE TWO

In the second case the patient entered the same hospital during the evening of Dec. 23rd, 1934. The operation began about 11.45 P.M. and lasted about three-quarters of an hour, the doctor returning home about 1 A.M. On the same day, Dec. 24th, the doctor wrote to the committee giving details of the operation and of his special experience, stating that he had informed the patient that the operation was outside the scope of medical benefit, enclosing an anaesthetic claim form, and inquiring whether in the circumstances the claim in respect of the services of an anaesthetist would be allowed. The doctor asked for a supply of anaesthetic claim forms as well as of G.P. 45, and inquired whether he would have to submit form G.P. 45 containing the particulars set out in his letter. Correspondence ensued and the case was submitted to the medical benefit subcommittee, who, under the provisions of Article 32 (2) of the Regulations, referred it to the medical service subcommittee. No fee had been charged. The service subcommittee found that the doctor performed the operation on Dec. 23rd-24th, and that form G.P. 45 was received by the committee on Dec. 31st. They reported that the terms of service are explicit that the notification should be on a form to be provided by the committee, and the subcommittee, taking the view that practitioners know that the time is extremely limited in which they are required to furnish the form to the committee cannot avoid the conclusion that the onus is upon the doctor to have the forms in his possession, ready for use, or to take the quickest possible means of obtaining such forms so as to be able to comply with the terms of service.

The insurance committee resolved, on the recommendation of the subcommittee, that in their opinion the terms of service had not been complied with, and that the doctor was precluded from making a charge to the insured person for the treatment given.

(Continued from previous page)

which the several approved societies were merged two years ago, has had no medical adviser on its staff. At present the national health insurance system operating in the Irish Free State performs no functions directly concerned with either the prevention or the cure of disease. It merely administers a number of cash benefits.

It is hardly to be wondered at that the doctor appealed, contending that the insurance committee had acted unreasonably. The report of the persons appointed to hear the appeal is again given in their own words:

"The doctor suggested that Christmas Day and Bank Holiday should be excluded in the computation of time, and that if the clerk had acted promptly in complying with his request for a supply of forms G.P. 45 the return would have been made in time. He also suggested that he had in fact complied with the terms of service by giving full particulars in his letter of Dec. 24th. He alleged that compliance with the terms of service was rendered difficult by the failure of the committee to afford adequate supplies of the forms, and said that only two forms were sent in response to his request of Dec. 24th. He alleged, further, that the clerk had adopted an unreasonable and unfair attitude towards him, and he illustrated his complaint by reference to a paragraph in a letter dated August 3rd, 1935, addressed by the clerk to the Minister of Health in reference to the doctor's appeal. The paragraph reads as follows:

"The substance of the doctor's contentions arises out of circumstances which require examination. It was not until the doctor was informed that a form was necessary and that he was out of time that he replied using words which clearly meant that he proposed to contend that Dec. 24th and not Dec. 23rd was the date of the operation, and it is submitted that this alteration was made for no other purpose but to enable him: (1) to state that he asked for a form in plenty of time, and (2) to use the fact that there had been a day's delay in answering his first letter for the purpose of throwing upon the office the responsibility for his non-compliance with the terms of service."

"The words used here by the clerk seem to contain the innuendo that Dr. A. did not carry out the operation on Dec. 24th, notwithstanding his assertion that he did so, and that in making the statement he was actuated by improper motives. The clerk used words to the same effect at our inquiry. We pointed out that the medical service subcommittee had found that the operation was performed on Dec. 23rd and 24th, and we asked the clerk whether, before deciding to question Dr. A.'s bona fides in this connexion, he had taken any steps to ascertain from the patient or from the hospital authorities whether the operation was completed before the 24th. He said that he had not done so. We need hardly say that the suggestion contained in the paragraph involves a serious reflection on Dr. A.'s character, and it should never have been made without first taking all possible steps to ascertain the true facts of the case; and we cannot help thinking that the clerk's action in this matter gives some support to Dr. A.'s allegation of unfairness on the clerk's part."

"We are not aware of any authority for the view that Christmas Day and Boxing Day should be excluded in the

computation of time, and we are forced to the conclusion that, on a strict construction of Clause 10 of the terms of service, Dr. A. failed to furnish the insurance committee with form G.P. 45 within the prescribed time, and that, consequently, any demand for payment of his fees would amount to a breach of the terms of service which would render him liable to disciplinary action. Having regard, however, to the fact that the insurance committee was immediately furnished with full particulars of the operation and that Dr. A. forwarded form G.P. 45 to the committee as soon as he could obtain a form from the clerk, we do not think that it was a case in which the committee should have thought it necessary to intervene if a fee were claimed.

"It should be noted that the resolution stated that the terms of service were not complied with. This is tantamount to saying that there had been a breach of the terms of service. As, however, Dr. A. had made no demand for the payment of his fees, it is impossible to hold that there had been any breach, and we accordingly recommend that the appeal be allowed.

"We have not made any direct reference to the clerk's arguments in this case. So far as we can understand them they were to the effect that the provisions of Clause 10 were quite rigid and left no discretion to the committee. We entirely dissent from this view. While it is true that the committee have no power to sanction a breach of the terms of service, we see no foundation for the view that they are bound to examine microscopically every transaction with a view to ascertaining whether there has been some technical departure from the terms of service, however insignificant. We consider that the insurance committee in these above two cases passed resolutions which were ultra vires, adopted an attitude towards Dr. A. which the circumstances did not justify, and put him to unnecessary trouble and expense, and we recommend accordingly that Dr. A. should be awarded costs against the committee."

In allowing the appeals in both cases the Minister directed that the doctor should be awarded five guineas costs against the committee, and practitioners will welcome this indication that the Minister approached the matter from a common-sense point of view. It is a pity that the committee were so insistent on the letter of the law that they appear to have blinded themselves to its spirit. In the second case, in particular, a reasonable person might well ask what details other than those given by the doctor in his letter of Dec. 24th would or could have been included in form G.P. 45—and anyhow who would seriously contend that either an appendicectomy or the removal of an ovarian cyst is other than a specialist service?

PUBLIC HEALTH

The Building Line in London

THE Town and Country Planning Act of 1932 gave the London County Council general control over the development of London, and therewith of the height of any buildings to be erected. The relevant committee in a report to the Council presented on Tuesday does not wish to enforce a general standard height throughout the county; it prefers to be guided partly by the traffic problems of the area but more especially by the need for ensuring sufficient light and ventilation for the buildings erected, particularly on the lower floors. The needs vary according as the area is (1) of a central business nature or chiefly used for basic industry; (2) residential but unsuitable for single family dwelling-houses; (3) suitable rather for family dwelling-houses than for multiple dwellings. In its model clauses the Ministry of Health has already suggested a limita-

tion in the height of buildings based on a maximum overall height restriction with an angular limit, and the L.C.C. town-planning committee has now arrived at a formula applicable to the three building zones indicated. In the third zone in which single family dwelling-house development is likely to predominate the height in feet is to be limited to 40 for dwelling-houses, whether single or multiple, and 60 for industrial buildings, the height not to exceed in any case the width of the street. In the multiple dwelling area the height of the single dwelling-house has the same limitation but the multiple dwelling may be 60 feet high and the industrial 80 feet. In the central zone the limit in each category may be exceeded by another 20 feet; and the height may be $1\frac{1}{2}$ or $1\frac{1}{3}$ times respectively the width of the street. Higher buildings may be permitted in special circumstances or special restrictions imposed in the neighbourhood of ancient monuments. The plan specifying the zones is to be issued before Easter.

Mr. Coste's Retirement

On April 8th Mr. J. H. Coste, F.I.C., chemist to the L.C.C. public health department, will reach the retiring age. Mr. Coste entered the Council's service in 1894, became chief assistant to the late Mr. Frank Clowes, D.Sc., in 1908, and when the chemical work was transferred to the public health department in 1913 he was given the designation of chemist in that department, and appointed official agricultural analyst for the county. The establishment committee

in announcing his retirement remarks that Mr. Coste has for many years held a very high position in the chemical world; his work with its extensive variety of analytical and experimental duties has been of great value to the Council, and by his retirement the Council is losing the services of a distinguished member of its staff. Mr. Coste is an authority on the treatment of sewage, technical gas calorimetry, and the investigation of fog and smoke; he has long been a member of the atmospheric pollution committee constituted by the Department of Scientific and Industrial Research.

THE SERVICES**ROYAL NAVAL MEDICAL SERVICE**

Surg. Cpts. G. V. Hobbs to *Ganges*; T. Creaser to *Pembroke* for R.N.B.; and E. C. Holton, O.B.E., to *Pembroke* for R.N.B., and for duty with S.R.A., R.N. Hospl., Chatham, as Naval Health Officer, Nore Command.

Surg. Comdrs. A. H. Harkins to *Victory* for R.N.B.; W. E. Heath to *Drake* for R.N.B.; and G. E. D. Ellis, O.B.E., to *Drake* for Devonport Dockyard.

Surg. Lt.-Comdr. (D.) R. J. M. Andrews to *Victory* for R.M. Infirmary, Portsmouth.

Surg. Lt.-Comdr. R. R. Baker to rank of Surg. Comdr.

Surg. Lt. W. F. Viret to *Tern*.

Surg. Lt. (D.) S. R. Wallis to *Neptune*.

A. F. Ferguson, J. B. Morris, H. P. L. Rhodes, and D. N. Williamson, as Surg. Lts. (D.) entered for short service, and apptd. to *Victory* for R.N. Hospl., Haslar.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt.-Comdr. R. B. H. Wyatt placed on Retd. List.

Surg. Lt. W. G. Campbell, M.B., to *Pembroke* for R.N.B.

Surg. Lt. (D.) L. B. Hilton to *Drake* for R.N.B.

ROYAL ARMY MEDICAL CORPS

Short Service Commissions: Lts. (on prob.) confirmed in their rank: J. J. Sullivan, M. Kosloff, A. Gleave, J. L. Gordon, A. M. Pugh, J. H. Taylor, D. N. Keys, G. C. Dansey-Browning, S. J. Meyersohn, M. H. P. Sayers, D. P. Stevenson, S. Brown, P. B. Hanbury, G. A. E. Harman, G. A. Weir, H. N. Perkins, J. D. Cruickshank, P. J. Geoghegan, W. N. J. Clarke, and T. D. M. Martin.

Lt. (on prob.) A. R. O. Denton resigns his commn.

REGULAR ARMY RESERVE OF OFFICERS

The undermentioned having attained the age limit of liability to recall, cease to belong to the Res. of Off.: Lt.-Col. R. E. Humfrey, C.M.G., and Maj. J. L. Wood, O.B.E.

Capt. A. Hemingway, from the Supp. Res. of Off. R.A.M.C., to be Capt.

SUPPLEMENTARY RESERVE OF OFFICERS

R. P. Leake to be Lt.

ARMY DENTAL CORPS

Lt. (on prob.) W. F. Finlayson is confirmed in his rank.

Short Service Commissions: To be Lts. (on prob.): R. Edwards, A. F. Town, H. J. Burns-Jones, W. J. Constantine, P. J. Pigott, and R. G. Kent. The undermentioned Lts. (temp. commissions) to be Lts. (on prob.): J. H. Sherwen, C. W. Upton, B. E. French, W. F. O'Carroll, and R. J. Godfrey.

TERRITORIAL ARMY

Capt. D. A. O. Wilson to be Divl. Adjnt., 53rd (Welsh) Div., vice Maj. G. E. MacAlevey, M.C., vacated.

Lts. to be Cpts.: W. D. F. Lytle, B. C. Jennings, J. Tidd, and H. W. E. Jones.

G. O. Brooks (late Cadet C.S.M., Oakham Sch. Contgt., Jun. Div., O.T.C.) and Scott-Russell Trick to be Lts.

TERRITORIAL ARMY RESERVE OF OFFICERS

Maj. R. B. Green, M.B., F.R.C.S., from Active List, to be Maj., Jan. 27th, 1936. (Substituted for the notification in the *Gazette* of Feb. 18th, 1936.)

ROYAL AIR FORCE

Squadron Leaders L. Freeman to R.A.F., General Hospital, Hinaidi, Iraq, for duty as Medical Officer;

T. R. S. Thompson to R.A.F. Station, Andover, for duty as Medical Officer.

Flight Lt. A. L. St. A. McClosky is promoted to the rank of Squadron Leader.

Flight Lt. F. I. G. Tweedie to School of Army Coöperation, Old Sarum.

Flying Offr. W. J. L. Dean to R.A.F. Station, Biggin Hill.

RESERVE OF AIR FORCE OFFICERS

Special Reserve: Flight Lt. D. S. Buchanan relinquishes his commission on completion of service.

INDIAN MEDICAL SERVICE

Maj. W. E. R. Dimond to be Lt.-Col.

The undermentioned officers retire: Col. Sir C. I. Brierley, Kt., C.I.E., and Col. W. T. McCowen, V.H.S.

Col. Brierley, whose name was in the recent New Year honours, was inspector-general of civil hospitals and jails, North-West Frontier Province.

Indian Medical Department: Maj. (Sen. Asst. Surg.) L. V. O. Eason retires.

COLONIAL MEDICAL SERVICE

Miss J. C. Drury, B.Ch., M.R.C.S., L.R.C.P., has been appointed Bacteriologist-Pathologist, King Edward VII. Hospital, Bermuda.

DEATHS IN THE SERVICES

Colonel SAMUEL JOHN THOMSON, C.I.E., I.M.S. (retd.), who died at Mentone on Feb. 27th in his 83rd year, was the son of Mr. J. B. Thomson of Ramsgate, and was educated at St. John's College, Hurstpierpoint, and St. Mary's Hospital. He qualified M.R.C.S. in 1874, was resident obstetric officer there, and later house surgeon at the Kent and Canterbury General Hospital. In 1877 he entered the Indian Medical Service, was gold medallist and Herbert memorialist at Netley, and was with the field force at the relief of Kandahar in 1880, being awarded the medal. In 1890 he became a member of the Leprosy Commission, and in 1896 was Sanitary Commissioner of the N.W. Province and Oudh. In 1902 he served as director of Burgher camps in the Transvaal, receiving the medal with two clasps. In 1898 he was created C.I.E. for services connected with plague and famine, and C.B.E. (Mil.) in 1919. He retired from the service in 1908, but on the outbreak of war in 1914 was appointed commandant to the 2nd War Hospital at Birmingham with the rank of brevet-colonel.

The death occurred on March 9th in London of Sir JAMES MAGILL, K.C.B., Colonel, late R.A.M.C. Son of the late Rev. William Magill of Cork, he was born in September, 1850, educated at Queen's College, Cork, and at University College, London, and took the degrees of M.D., M.S. Queen's University, Ireland, and M.R.C.S. Eng. in 1871. Entering the Army as staff assistant surgeon in March, 1872, he was appointed in 1876 to the Coldstream Guards becoming surgeon-major in 1885, surgeon lt.-col. in 1896, and ultimately colonel in the Army Medical Services. He served in the Sudan in 1884-85 (severely wounded at Abu Klea) and also in South Africa, 1899-1902. For these services he was mentioned in dispatches, received the medal with two clasps and the bronze star, and was again mentioned in dispatches, receiving two medals with eight clasps, and the C.B. (Mil.) in 1900. He was principal medical officer, Egypt, from 1905 to 1907, when he retired. He was appointed organising secretary of the British Red Cross Society in 1910 and the K.C.B. (Mil.) was awarded him in 1917.

CORRESPONDENCE

TREATMENT OF VAGINAL DISCHARGE

To the Editor of THE LANCET

SIR,—It appears that opinions differ considerably upon the subject of *Trichomonas vaginalis*. If one were to believe the literature issued by certain manufacturing chemists trichomonas is common. Mr. Luker says it is very rare. My own feeling is that in gynæcological practice the trichomonas though not common ought to be remembered, for once discovered it is fairly easy to eradicate. The type of case in which trichomonas infection should be suspected is where a discharge persists after routine treatment for urethral and cervical infection, gonococcal or non-specific. In such a case *Trichomonas vaginalis* would appear to be in the nature of a secondary invader, producing its effect when the original infection has abated. The following case is an example:—

A. B., aged 48 years, attended first complaining of vaginal discharge of ten weeks' duration which she had treated herself by douching. Gonococci were found in a urethral smear, and there was slight endocervicitis clinically. She was treated with douches, contramine pessaries, and later with a gonococcal vaccine. After six months' treatment there was clinically neither urethritis nor cervicitis, no pus cells in a urethral smear and few in a cervical smear. There persisted, however, a fairly profuse thick white vaginal discharge in which *Trichomonas vaginalis* was found. After one week's treatment with Devegan the discharge was considerably less, and trichomonas was not found. Treatment was repeated for a further week when discharge had ceased and no pus cells were seen in cervical or vaginal smears.

A vaginitis produced by trichomonas alone is manifested by a frothy yellow discharge and a vaginal wall marked with red spots. This clinical picture is not always seen in its entirety. In an article entitled Non-operative Gynæcological Treatment (Post-Grad. Med. Jour., March, 1936) Dr. V. B. Green-Armytage states that trichomonas infection is responsible for at least 30 per cent. of cases of the infective type of leucorrhœa in virgins. In a series of 25 cases, examined by permission of Miss G. M. Sandes, F.R.C.S., at the out-patient department of the London Lock Hospital (which is attended by gynæcological and urological as well as venereal disease cases), 5 (or 20 per cent.) were found to have trichomonas in the vaginal discharge. These cases conformed mainly to the type described above, and were chosen for investigation for that reason. They are not strictly comparable to the type to which Dr. Green-Armytage refers, but if the two are taken together they illustrate that trichomonas is not a factor to be overlooked in the investigation of any case of leucorrhœa.

The treatment adopted here is as follows: The patient is instructed how to insert a Devegan or Stovarsol tablet into the vagina, and does this each night. In some cases morning douching is ordered. Patients are seen each week and a vaginal specimen examined. In no case has trichomonas been found after one week's treatment, which is then continued until discharge ceases. A further week's treatment is given after the first menstrual period to avoid recurrence during the alkaline tide.

It would appear that Devegan, Stovarsol, Spirocid, and Orarsan are of equal service in this condition.

I am, Sir, yours faithfully,

JAMES MARSHALL,

March 6th.

Resident Medical Officer, London Lock Hospital.

GASTRIC ACIDITY AND ITS SIGNIFICANCE

To the Editor of THE LANCET

SIR,—Dr. A. F. Hurst's comments in your issue of Jan. 18th are of great interest to me because with a large mass of evidence and his great experience he has been able to confirm results which we hope to publish in the near future. Thus it has also been the experience of both Alvarez and ourselves (private communication) that the acidity remains high in gastric and duodenal ulcer in spite of severe hæmorrhage, and in certain other cases with gastric symptoms. We have also found free acidity in severe anæmias of other types. In my paper of Jan. 4th, however, I was not concerned with these cases, but confined myself to the hæmorrhagic anæmias without gastric symptoms. Further experience certainly seems to show that I have probably erred in placing my achlorhydria-hæmoglobin level too high. Whatever this level may be it is, after all, only an average, with, as I stated, considerable individual scattering above and below.

That the achlorhydria in our cases is secondary to the hæmorrhagic anæmia is shown by the fact that free acid appears and later rises with improvement in the blood condition. (Some individuals of course have achlorhydria throughout.) Further, in animals we can produce lowering of the acid at will by bleeding, and this condition remains as long as the animal is anæmic. The full details of these observations will be published in the near future.

As regards the effect of asthma, I was quite well aware that gastric acidity is commonly low or absent between attacks. But I threw out a suggestion that it might be of interest to investigate the effect of asthma on gastric acidity during the attack. Does the rise of plasma CO₂ during an attack raise acidity? Or does the accompanying anoxæmia have the opposite effect? I can find no information on the question.

I am, Sir, yours faithfully,

FRANK L. APPERLY.

Medical College of Virginia, Richmond, Virginia, U.S.A.,
Feb. 26th.

OPERATION FOR FEMORAL HERNIA BY A
MIDLINE EXTRAPERITONEAL APPROACH

To the Editor of THE LANCET

SIR,—In reference to Prof. A. K. Henry's article in THE LANCET last week (p. 531) may I refer him to the *Proceedings of the Royal Society of Medicine* (vol. xv., No. 4, 1922, p.13). He will see there that I described a midline extraperitoneal approach for inguinal and femoral hernia. The only modification I would make to that description is that I see no reason for not operating on younger patients. I would point also to the care that is necessary to avoid injury to the ureter in operating on femoral hernia.

I am, Sir, yours faithfully,

March 9th.

G. LENTHAL CHEATLE.

PROGNOSIS IN SPINAL CARIES

To the Editor of THE LANCET

SIR,—It is rather irritating to find an otherwise carefully compiled article seriously marred by figuring which will not stand careful scrutiny. In to-day's issue of THE LANCET there is an unfortunate example of this in the article Prognosis in Spinal Caries on page 562. Apparently the total number of cases

under review was 1666; of these 1582 cases were discharged during the period and 61 died. No mention of the 23 cases required to make up the total. Percentages are usually shown in relation to the total number treated, and in this case in my opinion they should be represented in this way:

Total number of cases	..	1666 = 100 %	
Discharged	..	1582 =	95.00 %
Died	..	61 =	3.64 %
Unaccounted..	..	23 =	1.36 %
			100.00 %

In "Causes of Death" the figures given in the first instance are—

Miliary T.B and meningitis	..	..	32
Sepsis and amyloid disease	..	..	16
Other causes	..	..	13

but if the tabulated figures are added up we get 32, 15, and 14 respectively. In an investigation of this kind it would probably be better to deal with only those cases in which a conclusion has been reached, and in this way the figures should be shown thus:

Total cases the outcome of which is known	..	..	..	1643
Discharged	..	..	..	1582 = 96.3 %
Died	..	..	..	61 = 3.7 %

As figures given in THE LANCET are frequently quoted in support of various theories it is very desirable that they should be clear and not capable of misinterpretation. I can offer no criticism of clinical observations but I can check the deductions when figures are involved and shall continue to dispute any theory put forward in the popular press which is founded on a fallacy. In the present case the discrepancy is not great but the fact that the death-rate is over-stated reduces the credit due to Sir Henry Gauvain for the excellence of his treatment which gives a death-rate only a little over three times that of the whole population.

I am, Sir, yours faithfully,
S. D. PERSY FISHER.

The Crescent, Alwoodley Park, Moortown, Leeds,
March 7th.

AN ADDRESS IN HARLEY STREET

To the Editor of THE LANCET

SIR,—I wonder whether any of your readers have noticed that within the last year or so the names appearing on door-plates in the Harley Street district have begun to introduce a continental note, so that the kudos of an address in this area is now international rather than national. When the doors of our hospitals and medical schools were thrown open a short while ago to medical refugees from another country it was expressly stated to those of us who are teachers at the medical schools that the Home Office were granting permits for these refugees to reside in this country for the purpose of obtaining a British qualification, but that they would not be allowed to practise here.

On this understanding we undertook, wrongly as I think, to teach these graduates of a foreign university with our undergraduates in the same classes and clinics. What has been the result? The harvest of British diplomas has been gathered, but there are no signs of our guests departing from our shores to practise elsewhere. On the contrary, hardly a week passes without my receiving an application from one of the new recruits to British medicine to be one of my clinical assistants; there is hardly an election for a minor staff appointment without the appearance as candidates of one or more; and, as I stated in the beginning, the crop of plates bearing continental

names increases daily. The reason given by one applicant for a clinical assistant post was, not that he wished to learn more of a particular subject, but that he thought it would help him to improve his knowledge of English. Another applying for the post of registrar, when asked whether it was his intention to practise his specialty in England, said, with the greatest assurance, "Oh! Yes" without any idea that it was a rare privilege for him to do so. Only yesterday I received a card in an open envelope from one of these gentlemen in which he acquainted me of the fact that he was a gynæcologist and surgeon, and that he had now established himself in the consulting area.

Surely this is a matter for investigation by those bodies representing medical interests in this country. It is already difficult enough for our younger men to make a living. The fact that I am on the staff of one of our teaching hospitals makes it necessary for me to claim the privilege of anonymity, but I enclose my card.

I am, Sir, yours faithfully,
London, March 7th. ALBERICUS.

STAMMERING

To the Editor of THE LANCET

SIR,—Mr. St. John Rumsey suggests that I seem to contradict myself but does not indicate in what way. In case, however, I did not make myself sufficiently clear in my letter of Feb. 22nd permit me to restate the matter. It is now definitely established that stammering is a psychic trouble which deranges the natural coördination of the muscles of respiration, voice, and articulation, bringing about faulty action of all of these. Consequently neither psychic treatment alone nor elocutionary instruction alone—nor indeed elocutionary treatment at all—can effect cure. Psychic analysis to remove fear and relaxation treatment to remove the muscular contractions caused by the fear are essential. These must be followed by re-education and coördination of all the muscles concerned in speech. To employ elocutionary measures is to focus the stammerer's attention on the symptoms, making matters infinitely worse. The most difficult cases to treat have in my experience been those where elocutionary instruction has been tried.

The dictionary tells us that elocution is "The art of effective speaking, more especially of public speaking, regarding solely the utterance or delivery; *eloquence*" (the italics are mine). Obviously therefore elocution does not in any way touch the cause of stammering.—I am, Sir, yours faithfully,

KATE EML-BEHNKE.
Earl's Court-square, S.W., March 9th.

REGULATION OF PROSTITUTION

To the Editor of THE LANCET

SIR,—Some of your correspondents have expressed doubt at my statement (in your issue of Nov. 9th, 1935, p. 1078) that the Congress of Dermatology meeting at Budapest last autumn "accepted as a fact that syphilis and gonorrhœa could be made extinct throughout the world within a single year if all who suffer from them would have themselves fully treated." It is true that no such direct statement was made from the rostrum, but from the discussion held on Sept. 13th, in No. 4 hall of the Hungarian Scientific Academy, on the international campaign against venereal diseases the inference could be drawn that, with adequately thorough treatment, gonorrhœa as well as syphilis, at whatever stage of the disease, could be brought within

a year or so to such a phase as not to be infectious any more. Hereditary syphilis, as stated by Hoffmann (Bonn) and Guszmann (Budapest), will shortly disappear from all civilised States. I quote their statements *literatim*.

Prof. J. GUSZMANN (Budapest): In the domain of syphilidology I see the greatest progress in the fact that to-day we are justified in asserting that congenital syphilis will shortly disappear entirely in all cultured countries and their terrible consequences will remain unknown to the next generation of physicians.

Dr. E. HOFFMANN (Bonn): As I have already emphasised in articles which have appeared in the *Wien. klin. Woch.* and the *Wien. med. Woch.*, with the aid of our present methods of intensive treatment congenital syphilis is well avertable and certainly curable. In consequence of this fact stillborn and macerated fetuses have entirely disappeared at many places (Germany, Denmark) where intensive and persistent treatment is applied.

From these premisses we can infer, without undue optimism, that sexual diseases could be made extinct within a year or so, if during this time we could enforce the strict and complete isolation of the patients, whereby the source of infection could be blocked. It is equally reasonable to imagine that by the enforcement of severe procedures—eventually punishment and internment—adopted internationally against venereal patients caught or reported to spread the diseases at large and by applying treatment on them the infectivity of such patients would cease and as a consequence venereal disease would disappear. Laws to this effect are already in force in Germany and Rumania; a draft Act has just been prepared in Hungary.

I am, Sir, yours faithfully,

YOUR BUDAPEST CORRESPONDENT.

Budapest, Feb. 27th.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Home Office Administration

On March 5th, on a vote for the Civil and Revenue Departments, Mr. BENSON raised the subject of the

PSYCHOLOGICAL TREATMENT OF DELINQUENTS

He acknowledged with gratitude the sympathetic way in which the Home Office had dealt with this matter in the past. The first official recognition of the psychological problem or the possibility of the psychological treatment of delinquents and criminal offenders was in a Departmental Report issued in 1932. The Home Office immediately appointed a psychiatrist who he believed was working at Wormwood Scrubs. His object in raising the matter that day was to appeal to the Home Office to go a little bit further.

It was true, he said, that the psychological treatment of delinquents was in a purely experimental stage, but so was the treatment of cancer. In practically all medical matters treatment and experiment were bound to go hand in hand. With regard to psychiatry particularly as applied to delinquency it was essential that psychiatrists should be encouraged in their work on the subject and allowed every possible facility for the treatment of delinquents in order that they might extend and improve their technique and bring it out of the experimental stage. At present the work was extremely haphazard very largely owing to the shortage of facilities. It was not that the Home Office was responsible for that. There was a brilliant band of psychological specialists working on this matter but unfortunately they had to apply a long, arduous, and extremely difficult technique, and they were gravely hampered by lack of funds, lack of buildings, and lack of almost everything that would make either their experiments or their treatment efficient and helpful. At the present moment there was a single Government psychiatrist he thought at Wormwood Scrubs, and there were six London hospitals which had psychological clinics, and these occasionally took delinquents. There was the Institute of Medical Psychology, where again the treatment of delinquency was a side line, though they had done most valuable work and had gathered very valuable data. There was also one small new body—the Institute for the Scientific Treatment of Delinquency—which was the only specialist body in the country dealing with the psychiatric treatment of crime and criminals.

The type of case that came before these clinics for treatment was extraordinarily varied. It was not merely the sex case as so many people seemed to imagine. In 1934 and 1935 the following cases came

into the hands of the Institute for the Scientific Treatment of Delinquency:—

Attempted murder ..	1	Theft (including four burglars) ..	46
Violence ..	7	Shop lifting ..	14
Attempted suicide ..	9	Embezzlement, forgery, and false pretences ..	26
Sex cases ..	36	Other kinds of cases ..	29
Wandering ..	13		

In dealing with this subject, Mr. BENSON continued, the Home Office would have to get the coöperation of judges and magistrates. In London he was glad to say the magistrates were awakening to the importance of the matter. In 1935 they sent to the Institute for the Scientific Treatment of Delinquency twice as many cases as they sent in 1934. In the second place the Home Office would have to realise the necessity for the provision of treatment for cases in which it was recommended by the courts. In London the possibilities for this treatment were hopelessly inadequate and in the provinces they were entirely non-existent. It was a really staggering fact that outside London there were only four doctors with the qualification of the Institute of Psycho-Analysis. All the rest of the doctors with that qualification were in London. There was one doctor in Manchester, one in Reading, one in Southsea, and one in Edinburgh. The Home Office would have to face this problem because the psychiatric treatment, not merely of delinquents but of any neurotic person, was fundamentally different from that given by the hospitals. To allow this type of treatment to depend on the voluntary work of a small handful of specialists was out of the question. If this problem was to be thoroughly tackled the Home Office sooner or later would have to provide its own trained psychiatrists and to regard this as a curative branch of the prison service.

SILICOSIS—MINERS' NYSTAGMUS

Mr. HOLLINS drew attention to the position of hundreds of thousands of workers engaged in occupations in which the dreadful disease of silicosis had developed. He would prefer that there should not be the present limitation with regard to silicosis because Section 47 of the 1925 Act only scheduled the occupation and not the disease. Wherever a workman contracted this dreadful disease as a result of following an occupation he should be allowed to make a claim for compensation. Under the scheme of Section 47 of the 1925 Act, and the amending Act of 1931, medical boards were introduced and the experience of the pottery industry was that these boards were operating in a perfectly satisfactory manner. The workers would prefer the medical boards to the system of medical referees and certifying surgeons. They preferred that there should be a second or third opinion rather than that the decision should be

left to one man. They could see no reason why silicosis should not be scheduled as a disease so that medical boards would administer the matter.

Mr. TINKER raised the question of miners' nystagmus and urged that the Home Office should consider having more than one medical man to judge these cases. He thought there should be at least three. The medical referee might be right in his judgment but the workman always felt that he had not had a fair deal.

ACCIDENTS IN FACTORIES AND WORKSHOPS

Mr. SHORT called attention to accidents in factories and workshops. He said that judging from the last report of the Chief Inspector of Factories there had been a notable increase in the number of accidents, particularly of a non-fatal character, and the inspector emphasised the growing volume and nature of the accidents. There was need for greater care and supervision. The accident rate among young people was much greater than the rate among adults. The inspector's report also drew attention to the need for greater care and supervision in order to deal with accidents in connexion with hoists and lifts. He thought that they had not enough inspectors and he hoped that the Government would agree to appoint a larger number. He also called attention to carbon monoxide poisoning arising from petrol fumes. Many drivers and other workers employed on petrol-driven omnibuses suffered from gastric complaints from inhaling these fumes. There ought to be a closer association with the medical profession as regards the health of the workers. There should be a greater diffusion of knowledge concerning industrial diseases. Medical men ought to be encouraged if they believed that a complaint from which a patient was suffering arose from the patient's occupation to communicate that fact to the Home Office.

THE UNDER-SECRETARY'S REPLY

Mr. GEOFFREY LLOYD said that with regard to the psychological treatment of delinquents the Home Office, while keeping its mind thoroughly open to all new schools of thought, would not rashly adopt schemes or theories which were not yet thoroughly tried out or approved. Psychologists had not achieved complete agreement among themselves. The Home Office had sent a circular to courts of summary jurisdiction in which they drew attention to the desirability of obtaining a medical report on the offender in any case where the circumstances of the offender or his demeanour when before the court suggested doubt as to his mental condition. That was only one side of the question. It might well be that there were some offenders who were not mentally normal and who ought to be under some form of restraint but who could not be dealt with except by being sent to prison. The Home Office had appointed a specialist in mental psychology as part-time medical officer at one of the London prisons. It was too early to arrive at any conclusions as to the type of case which was most likely to respond to such treatment or to give permanent results.

The Home Office would, he said, look into the points raised about industrial disease and accidents. There was a committee sitting on the subject of miners' nystagmus. With regard to silicosis, it was very slow in its onset and that was one reason why it was not suitable to be scheduled under the ordinary provisions. The other reason was that it was difficult to diagnose. In general the Home Office felt that it was not wise to scrap all the work that had been done in gradually building up this complex system of silicosis schemes which had been added to and improved as the result of experience. It was better to go on experimenting on and making researches into the causes of the disease and they were ready to examine any evidence as to the occurrence of the disease in any other occupations or circumstances, and so in time to make improvements. At the present time the Home Office were conducting a number of examinations on silicosis and in particular

the Medical Research Council was at work on the subject. The prevention of silicosis was also receiving attention. The Department was alive to its function of assisting in the prevention of accidents. He drew attention to the Industrial Museum in Horseferry-road. The Department had a clearing house for knowledge from all parts of the country in relation to safety, health, and welfare in factories. The question of carbon monoxide poisoning among drivers of petrol-driven vehicles was being examined by a medical committee at the present time.

Alcohol and Road Accidents

In the House of Commons on March 4th, Mr. C. C. TAYLOR, moving a resolution urging H.M. Government to press forward all possible measures to achieve reduction in road accidents, remarked that the drunken motorist should be treated as a criminal lunatic; but he submitted that a moderate amount of alcohol had no more effect in producing accident than had severe shock or excitement, and if a man was moderate in his ways it would not affect him when he drove a motor-car.—Dr. SALTER, who followed, insisted that a far greater danger than actual drunkenness was the "subintoxicated" motorist. The British Medical Association, he said, improvised this term to indicate a person who though not obviously under the influence of drink in the legal sense was none the less physiologically under the influence of drink. Notwithstanding the expert advice given to him the Minister of Transport, he said, had taken no steps to bring the extreme danger of consuming alcohol, before driving or when driving, before the motoring public, and this in spite of specific evidence brought to his notice that the consumption of even quite small quantities of alcohol led to a reduction in the efficiency and capacity of the driver. The Minister having asked for the advice of the B.M.A. had not only failed to give publicity to the conclusions of its committee but had poured ridicule on them. Other nations, said Dr. Salter, had brought the danger of small quantities of alcohol before every driver and every applicant for a license or its renewal. In Germany every applicant was handed a card on which he was warned not to touch alcohol even in small quantities before he started to drive; he had to sign a book in the police president's office declaring he had received the card and had read and understood it. In the judgment of many experts, said Dr. Salter, at least 25 per cent. of the fatalities and accidents on the roads were due to the fact that drivers were subintoxicated.—Sir ERNEST GRAHAM-LITTLE, who asked the Minister for a more thorough investigation of the causes of accidents on the road, said it had been shown that about one-quarter of the population at any given time were definitely prone to accident, and this accident-proneness could be identified by suitable tests. It should be possible, he thought, to introduce if only on an experimental basis such tests for a portion of the persons concerned.—Mr. HORE-BELISHA, in replying, remarked parenthetically that the development of roads like the growth of forests was a long process. He denied suppression of the B.M.A. report, remarking that it was published at sixpence a copy, while Dr. Salter wanted it to be published at the Government's expense. Doctors having undertaken this work he did not see, he said, why the medical profession should not get what advantage they could from the sale of the report. Anyone who desired to do so could read the report and learn that there was no proposal emerging from it which the Minister could put into operation. Mr. Hore-Belisha added that he mentioned the subject in the Highway Code for the first time.

Sir FRANCIS FREMANTLE intervening suggested that what the Minister had said did not in the least enforce the particular point of the medical inquiry which was to bring it home to people that the least quantity of alcohol before driving a car involved danger.—The MINISTER rejoined, "I agree with my hon. friend that the B.M.A. laid it down

that alcohol even in small doses was liable to have a bad effect on the driving of a car, but it does not fall to me to operate their recommendation. I cannot prevent people who have taken some alcohol from driving cars; I can only call attention in general terms to the matter. I have indicated in the Highway Code that it is undesirable that motorists should drink when they are going to drive cars, and I do not think that I can do more than that."

The Minister indicated that in coöperation with the Home Secretary and the Secretary for Scotland he was this year as from April 1st making an analysis of all accidents involving death or injury.

Milk Supplies and the Problem of Nutrition

In the House of Lords on March 10th Earl DE LA WARR Parliamentary Secretary to the Board of Education, moved the second reading of the Bill which extends for a further 18 months the provisions of the Milk Act, 1934.

Viscount ASTOR said that as chairman of the League of Nations Commission he knew what was being done under the auspices of the League to develop a nutrition policy in this and other countries. The movement in that direction was very largely due to the work of Earl De La Warr. The fact was beginning to be appreciated that if children had an ample supply of milk they would become healthier and better citizens. It was unlikely that there would be a spectacularly large increase in the consumption of milk through the supply of cheap milk to schools, but he hoped that the increase would be steady. Unless the price of milk to the consumer could be substantially lowered there would not be the full consumption of milk which was desired. Three ways by which the price of milk could be lowered were, reduction in the price of distribution, reduction in the cost of production, and a subsidy. Something should be done along these three lines. There was a very large surplus supply of milk because the producers' price was too high; the aim should be to produce as much cheap milk as possible.

The Bill was read a second time.

HOUSE OF COMMONS

WEDNESDAY, MARCH 4TH

Maternal Mortality in Glasgow and Greenock

Mr. DAVIDSON asked the Secretary of State for Scotland the figures of maternal mortality for 1935 in Glasgow and Greenock respectively.—Sir GODFREY COLLINS replied: The number of maternal deaths in Glasgow in 1935 was 155 and in Greenock 11, representing rates of 7.0 and 6.5 per thousand births respectively.

Medical Examination of Air Pilots in Scotland

The Marquess of CLYDESDALE asked the Under-Secretary of State for Air whether, in view of the large increase of commercial pilots in Scotland and the expense and inconvenience to which they were placed in presenting themselves for medical examination in London, he was prepared to authorise the appointment of a Medical Board for Scotland, either in Glasgow or Edinburgh, to include an approved resident doctor, which board would refer borderline cases to the central board in London.—Sir P. SASSOON replied: I regret that the number of applicants from Scottish addresses does not justify the setting up of a special board in Scotland. Medical examination in London is ordinarily only insisted upon in connexion with the initial grant of the licences, when the candidate's presence in London is in any case necessary, for the technical or flying test, and once in every two years subsequently.

Sounding of Motor Horns and Fatal Road Accidents

Mr. BOULTON asked the Minister of Transport if he was aware that coroners in several cases had made severe strictures on accused persons for not sounding their motor horns after hours, causing fatal accidents; and if he was still satisfied that this law was serving a useful pur-

pose.—Mr. HORE-BELISHA replied: I am aware of one such case. I am amply satisfied that the law is serving a useful purpose, and I should imagine that coroners generally, like other citizens, assist in its observance.

THURSDAY, MARCH 5TH

Occupational Diseases Convention

Mr. CREECH JONES asked the Home Secretary whether the Government had given recent consideration to the ratification of the Workmen's Compensation (Occupational Diseases) Convention (Revised), 1934, No. 62; and when it was proposed that the Convention should be ratified.—Sir JOHN SIMON replied: The Government propose to ratify this convention and the formalities for ratification are now being carried out.

Accidents Convention 1925 (No. 17)

Mr. CREECH JONES asked the Home Secretary whether he would now consider, with a view to ratification, the Workmen's Compensation (Accidents) Convention, 1925 (No. 17).—Sir JOHN SIMON replied: I am advised that this convention could not be ratified without far-reaching changes in the law and medical arrangements of this country, and I see no prospect of such legislation being passed at present.

Gas Mask for Civilian Protection

Mr. SHORT asked the Home Secretary whether he would arrange for Members of this House to attend a demonstration of the gas mask to be used for the protection of the civilian population.—Mr. G. LLOYD replied: When the design of the respirator referred to is finally settled, I shall be very glad to arrange for a demonstration, and I hope that hon. Members will not merely attend but also test for themselves the efficacy of the respirator in various concentrations of poison gases.

Protection of Public against High Explosive and Incendiary Bombs

Lieut.-Commander FLETCHER asked the Home Secretary what precautionary instructions, in addition to those against gas attacks, he was sending to local authorities with regard to attacks by high explosive and incendiary bombs.—Mr. G. LLOYD replied: It is hoped to issue handbooks and memoranda making available to local authorities, industrial undertakings, and the public generally the information at the disposal of the Government on protection against high explosive and incendiary bombs; and I can assure the hon. Member that this aspect of the subject is being given the careful consideration which it requires as an integral part of all air raids precautions schemes.

Law and Practice Relating to Coroners

Viscountess ASTOR asked the Home Secretary whether it was proposed to introduce a Coroners Amendment Bill, following the recent publication of the report of the departmental committee which inquired into the law and practice regarding coroners.—Sir JOHN SIMON replied: Legislation would be required to give effect to a number of the committee's recommendations, but I cannot make any statement until there has been an opportunity of giving full consideration to the report.

Boy Patient at Napsbury Mental Hospital

Mr. MESSER asked the Minister of Health if he was aware that John Henry Fuller, a boy of 14 years of age, was the only boy patient in the Napsbury mental hospital, where all the other patients are adults; and if he would take steps to obtain his transfer to a more suitable institution.—Sir KINGSLEY WOOD replied: The question of this patient's transfer to another institution has already been carefully considered, but I am advised that it is not at present desirable or practicable, having regard to his mental condition, as to which I am communicating with the hon. Member.

Maternity and Child Welfare in Wales

Mr. WILFRID ROBERTS asked the Minister of Health whether his attention had been called to figures and

graphs showing the reduction of maternal mortality in the Rhondda valley as the result of the provision of additional meals as well as milk to expectant mothers; and whether he would supply these figures and graphs for the information of Members.—Sir KINGSLEY WOOD replied: I have requested the medical officers of my department who are investigating the problem of maternal mortality to pay careful attention to the information regarding Rhondda referred to by the hon. Member. I have no doubt that they will deal with it in their report which I hope to receive from them when they have completed the extensive inquiry they are now making. The report, which will be presented to Parliament as soon as it is received, will, I think, be the best way of bringing to the notice of hon. Members the facts in this and other cases, and the conclusions to be drawn from them.

MONDAY, MARCH 9TH

Health Conditions in a Factory

Mr. CREECH JONES asked the Home Secretary whether his attention had been drawn to the conditions of work at the Cotopa mills, Guiseley; whether he was aware of the bad physical effects of such employment; whether he would ask the inspector of factories to give special attention to the processes carried on in this mill and consider scheduling the work under the list of dangerous trades; and in the meantime if he would impose rigid rules to govern the period of actual work on the respective processes, insist on mechanical draught by fan being employed to remove fumes and gases and the provision of adequate washing facilities, and the taking of meals by the workpeople in places other than in the mills.—Mr. GEOFFREY LLOYD replied: It appears from a report by one of the medical inspectors of factories who has visited these mills that no serious trouble has arisen, but that some of the employees have suffered from sore eyes due to fumes. It would seem that this can be prevented by improved ventilation in the process room, together with more care on the part of some of the men to wear the goggles provided for them, and methods of improving the ventilation are to be discussed with an inspector. A canteen with messroom and washing accommodation is being built. There appears to be no case on grounds of health for restricting the hours of work or for prohibiting the taking of meals on the premises, but the works will continue to receive special attention.

Bombing of British Red Cross in Abyssinia

Mr. COCKS asked the Secretary of State for Foreign Affairs whether he could give the House any information regarding the bombing of the British Red Cross hospital at Karen; and whether H.M. Government had made a protest to the Italian government against this breach of international law?

Sir ASSHETON POWNALL asked the Secretary of State for Foreign Affairs whether he had any information with regard to the bombing by the Italians of a British Red Cross ambulance.—Viscount CRANBORNE, Under-Secretary for Foreign Affairs, replied: On March 5th H.M. Minister at Addis Ababa telegraphed a message from Dr. Melly, the leader of the British Red Cross ambulance in Northern Ethiopia, stating that the British ambulance was heavily and deliberately bombed at midday on March 4th while situated in the open on Korem plain, two miles from the nearest troops. There was a Red Cross ground flag 40 feet square in the centre of the camp, and red crosses on the tents and the flagstaff. The operation, sterilisation, and three ward tents were destroyed, as well as one lorry. Three patients were killed and several wounded. There were no casualties amongst the personnel. The aeroplane, according to the message, circled low over the camp nine times, dropping about forty bombs, one of which fell on the ground flag. The message added that the camp had previously been observed many times at Waldia, Allamata and Morem by low-flying aeroplanes. It has subsequently been reported that the ambulance was again bombed on March 5th. On the receipt of the first telegram from H.M. Minister at Addis Ababa, H.M. Ambassador at Rome was instructed to lodge an immediate protest with the Italian Govern-

ment on the facts as stated by Dr. Melly, and to make it plain that H.M. Government expect them to order an immediate investigation and, in the meantime, to issue the strictest instructions against a recurrence of this incident. In reply to this communication, Signor Suvich, while not prepared to admit the accuracy of Dr. Melly's report, nevertheless stated that an inquiry would be instituted, and that instructions would be issued to avoid a repetition of the incident. On receipt of the news that the second bombing incident had taken place, my right hon. friend instructed Sir E. Drummond to renew his representations in the strongest manner and to ask for an assurance that the necessary instructions had been issued and their receipt acknowledged by the Italian military authorities. The result of these further representations is not yet known.

Sir A. POWNALL: Has the noble lord any information with regard to the death of Major Burgoyne and has his attention been called to a statement in the *Times* on Saturday by their Special Correspondent who himself saw this episode, that the bombing was unquestionably deliberate?

Viscount CRANBORNE: That is a different question.

TUESDAY, MARCH 10TH

Erysipelas Deaths

Mr. VIANT asked the Minister of Health whether his medical staff had formed any opinion as to the cause of the marked increase in the number of deaths certified as being due to erysipelas during the years 1930 to 1934.—Mr. SHAKESPEARE (Parliamentary Secretary to the Ministry of Health) replied: The incidence of this disease, the increase of which is only one manifestation of the increased prevalence of a group of diseases of similar causation which has tended to occur in waves of a few years' duration, is receiving the attention of my right hon. friend's medical advisers, but he is advised that no firm conclusions are at present possible as to the reasons for this periodicity.

Voluntary Patients in Public Mental Hospitals

Mr. SORENSEN asked the Minister of Health the number of voluntary patients in public mental hospitals during the last week of 1935.—Mr. SHAKESPEARE replied: The figures are not available for the last week of 1935, but on Jan. 1st last there were 4296 voluntary patients in public mental hospitals, and 229 in the Maudsley Hospital.

Medical Opinion and Fitness for Light Work

Mr. HARDIE asked the Secretary of State for Scotland whether, in view of the number of cases coming under the Scottish Health Department, where men were being told by medical opinion that they were only fit for light work, he could give a definition of what constituted light work; and on what grounds his department said that a man was fit for work when certified as suffering from mitral stenosis.—Sir GODFREY COLLINS replied: The cases which the hon. Member has in mind are presumably those of persons who have been examined by the regional medical officers of the Department of Health on the question of their incapacity for work. If and when the opinion is expressed that the persons concerned are only fit for light work the phrase "light work" is used in its ordinary sense, that is, as indicating work not involving physical effort of an arduous nature. With regard to the last part of the question, I am advised that mitral stenosis does not necessarily involve incapacity for all kinds of work.

AN ANONYMOUS DONOR.—On March 6th Mr. Henry Ward, formerly well known as a civil engineer, died at the London Hospital at the age of 87. In 1923, under a condition of strict anonymity he had given to the hospital £100,000, of which £80,000 was devoted to the general endowment and the remainder to general purposes. Mr. Ward was for 33 years a member of the London County Council and for 30 years he served on the Metropolitan Water Board.

OBITUARY

**JOHN WHEELER DOWDEN, M.B., LL.D.,
F.R.C.S. Edin.**

LATE PRESIDENT OF THE ROYAL COLLEGE OF SURGEONS OF
EDINBURGH

THE death occurred on March 8th of Mr. John Wheeler Dowden, the well-known Edinburgh surgeon, after a brief illness. Born in 1866, the son of the Right Reverend John Dowden, bishop of Edinburgh, he was educated at Merchiston Castle School and the University of Edinburgh. He graduated as M.B., C.M. in 1890 and served as resident surgeon and resident physician at the Royal Infirmary from 1890-92, and in the latter year was appointed resident



MR. DOWDEN

[Photograph by Swan Watson]

physician at the Edinburgh Royal Hospital for Sick Children. He took the diploma of F.R.C.S. Edin. in 1894 and was appointed assistant surgeon to the Hospital for Sick Children, tutor in clinical surgery at the University Medical School, and surgeon to the New Town Dispensary. In 1912 he was appointed surgeon to the Infirmary and lecturer on clinical surgery in the school of medicine of the Edinburgh Royal College of Surgeons, while he was appointed surgeon to the Chalmers Hospital. He served the Royal College of Surgeons of Edinburgh and the University of Edinburgh as an examiner in surgery, pathology, and operative surgery, and examined also in surgery at the University of Durham, while over a long period of years he made valuable clinical contributions to medical journalism, principally to the *Edinburgh Medical Journal*, the *Scottish Medical Journal*, and the *Transactions* of the Medico-Chirurgical Society of Edinburgh.

Alike as surgeon and teacher Dowden was conspicuously successful. He had a fine apprenticeship under Annandale, Cotterill, and Joseph Bell, and he maintained the high standard of the Edinburgh school of surgery on both academic and practical lines. His classes were fully attended and the students learned from him much that he knew would be useful to them in meeting the calls of daily practice. His instructions both in the wards and in the lecture theatre were marked with particular attention to common surgical ailments, and he brought out this side of his teaching well in a manual written in 1928 entitled "Clinical Surgery for Junior Students." His published records of operative work displayed its all-round character and high technical skill, while in his war service he was found to be particularly successful in orthopaedic surgery during his attachment to the Edinburgh war hospital at Bangour and the 2nd Scottish General Hospital at Graigleith. In the *International Journal of Surgery* he wrote of the surgical lessons learned during the war. His professional distinction was realised by his position in

the Royal College of Surgeons of Edinburgh, by his honorary fellowship of the Royal College of Physicians of Edinburgh, and by the LL.D. degree given to him by the University on its 350th anniversary, while at the time of his death he was Manager of the Edinburgh Royal Infirmary.

We quote the following tribute from one of his colleagues: "To those who had the privilege of knowing Dowden intimately, his personality, his upright character, and his vitality made a strong appeal. In him they possessed a loyal and genuine friend who had many attractive qualities: a kindly and sympathetic nature; a whole-hearted infectious enthusiasm for work and recreation; a genial humour, free from any suggestion of cynicism or satire, illuminating his faculty and facility as a story-teller."

Outside his professional interest Dowden was remarkable for the regard in which he held his old school of Merchiston. He was for a long period on the governing body and was at the time of his death chairman. He was mainly instrumental in bringing to a successful issue a scheme for transferring the school from Merchiston Castle to its present site at Colinton. As a young man he had been a prominent sportsman representing his school and university both in cricket and football, while in later life his holidays were devoted to angling.

Mr. Dowden married in 1907 Edith Georgina, daughter of the late Surgeon-General H. R. Oswald, and she survives him.

**HENRY JOHN BANKS-DAVIS, M.B. Camb.,
F.R.C.P. Lond.**

WE regret to announce the death of Mr. Banks-Davis, well known as otologist and laryngologist, which occurred on March 5th at his London address.

Henry John Banks-Davis was the son of the distinguished artist and Academician, H. W. B. Davis, and was born in 1867. He was educated partly in France and partly at Marlborough and entered Trinity College, Cambridge, where he graduated in arts in 1888. He proceeded to St. Thomas's Hospital, took the medical degrees of M.B., B.Ch. in 1895, and served in the hospital as house surgeon and for a time as demonstrator of practical surgery in the medical school. For a time he was resident medical officer to the West London Hospital, and at this period of his career saw considerable post-graduate practice in Paris, Berlin, and Vienna. He then decided to specialise in diseases of the ear and throat. He became chief assistant in the throat and ear department of the Middlesex Hospital and in 1904 was appointed surgeon to the throat, nose, and ear department of the West London Hospital, having been originally elected as assistant physician. His scientific attainments as well as his sympathetic personality soon obtained for him a considerable practice, while contributions of a practical nature to medical journals and to the *Proceedings* of the Royal Society of Medicine confirmed his expert position. In 1912 he was elected F.R.C.P. Lond. His military services were varied and extensive. Some 40 years ago he acted as surgeon to the national fund of the Red Cross in the Greeco-Turkish war and received from the King of the Hellenes the order of the Redeemer of Greece; in the South African war he did useful work to the invalided soldiers and nurses as a member of committees administering funds for those purposes; and during the recent war he held appointments in

several hospitals receiving injured naval officers, where he maintained a high position as a specialist. He had a wide reputation outside his own country due to his frequent selection as a delegate for Cambridge University to international conferences, attending in this capacity conferences on laryngology and otology in Boston, Vienna, and Berlin. He was aural referee to the Civil Service at the time of his death, and had been president of the otological and laryngological sections of the Royal Society of Medicine.

A personal friend writes: "Banks-Davis was appointed to the West London Hospital as assistant physician but relinquished the post to take up work in the ear, nose, and throat department in the days when such work was not regarded as so definitely surgical as it now is; he was assistant to Dr. J. Barry Ball, the physician on the staff of the hospital who had charge of the department, and he succeeded him.

His enthusiasm for his specialty, kindly treatment of the patients, and uniform courtesy combined to build up a large clinic to the great benefit of the hospital. His lectures to the post-graduate college were well attended and much appreciated. He held no other hospital appointment, and was able to devote the whole of his energies to the West London which he served so well. Banks-Davis never married. Once, when I asked him why, he replied that he was wedded to his profession. Conservative by nature he was a man of settled habits. At college he had been a prominent oar. He was a keen fisherman and delighted in salmon-fishing on the Wye, a sport in which he was very proficient, while he had a property in Wales to which he was very attached. With Banks-Davis a friendship once formed was ever loyal and unswerving. He was a man of outstanding personality and gifted with charm and a subtle sense of humour."

MEDICAL NEWS

University of Oxford

An election of two members of the board of the faculty of medicine of this university will be held on June 5th. Nominations must be signed by six members of the general medical electorate and reach the secretary of faculties at the University Registry, Oxford, before May 15th.

University of Birmingham

It is announced that an anonymous donor has placed considerable funds at the disposal of the University for an investigation by Prof. W. N. Haworth, F.R.S., head of the department of chemistry, into the possibility of producing an improved form of insulin.

During the summer term five William Withering lectures will be given on the chemical and biological aspects of immunology. On April 30th, May 14th and 28th Prof. W. W. C. Topley, F.R.S., will speak and on May 7th and 21st Mr. Percival Hartley, D.Sc. The Ingleby lectures will be given this year on May 20th and 22nd by Dr. Walter Schiller, pathologist to the Frauenklinik of the University of Vienna, who will speak on ovarian tumours (granulosa-cell, Brenner, and a new variety, mesonephroma ovarii). He is taking the place of Prof. Frankl who is unable to come as arranged. Prof. Arvid Wallgren, physician-in-chief to the Children's Hospital at Göteborg, has been appointed Ingleby lecturer for 1937. All these lectures will be given at 4 p.m. in the University.

Post-graduate courses in neurology will be held from May to July and in industrial hygiene and industrial medicine from July 13th to 24th. Further information may be had from the dean of the medical faculty.

International Cancer Congress

The Second International Congress of the Scientific and Social Campaign against Cancer will be held in Brussels from Sept. 20th-26th, under the patronage of the King of the Belgians and Queen Elizabeth. The national executive committee of the Congress consists of Dr. Lerat (chairman), Profs. Delrez, Dustin, Goormaghtigh, and Maisin (directors of the anti-cancer centres of Liège, Brussels, Ghent, and Louvain respectively), Dr. Sluys, Dr. Timbal (director-general of the Government Department of Hygiene), Mr. H. Marchal, and Mr. W. Schraenen (general secretary of the Congress).

The programme has been divided into two main parts, embracing the scientific campaign and the social campaign against cancer. In the first part the subjects on which official reports will be prepared and upon which individual communications are invited are grouped together under the following headings: experimental investigation (including the study of predisposing factors); diagnosis; and treatment. In the second part, on the social campaign against cancer, the subjects dealt with are: access of patients to diagnosis and treatment; medico-social assistance to incurable cases; and cancer and demography, including statistics and racial incidence. The list

of official rapporteurs is not yet complete, but among those who have agreed to present reports are: M. Borst, J. W. Cook, W. Cramer, H. F. Deelman, L. Dublin, A. P. Dustin, J. Ewing, W. E. Gye, H. Holthusen, E. L. Kennaway, J. Maisin, M. Nagayo, F. Pentimalli, Cl. Regaud, P. del Rio Hortega, G. Roussy, C. Rowntree, H. Schinz, and F. Carter Wood.

Further particulars may be had from Mr. W. Schraenen at 13, rue de la Presse, Brussels, Belgium.

Public Analysts and Other Analytical Chemists

Although the Society of Public Analysts (since widened to include other analytical chemists) was founded in 1875, two original members—Dr. Bernard Dyer and Dr. J. A. Voelcker—were present at the annual dinner on March 6th and responded to the informal toast of their healths. Mr. John Evans, M.Sc., who presided, proposed the toast of H.M. Ministers to which Sir Kingsley Wood responded, remarking that the first Minister of Health in history seemed to have been Moses, who issued wise enactments for the bodily well-being of the Israelites. Sir Kingsley thought that the responsibility of Ministers was increasing and among them the public health service was of prime importance as a defence and insurance against ill-health. Referring to food which came within the scope of the society's work, 25 million tons a year, he said, were consumed, and it was necessary that nothing should be added to or taken from it, which might lower its quality. The public analysts were the chief defenders of the people's food; the burden laid on them was increasing, but although he had much to do with their work he took no part in their remuneration. The Public Prosecutor, Sir E. Tyndal Atkinson, in proposing the health of the Society, referred to the complicated problems analysts had to solve, both as to what foods should be and in finding out what they were. He spoke with appreciation of the work of the president elect, Dr. Roche Lynch, and said how much the problems of food analysis had changed since Frederick Accum wrote his book on food adulteration some hundred years ago, when bakers, brewers, and druggists were engaged in a vicious circle of poisoning one another with their respective products. The President, in replying, spoke of the many branches of analytical work, instancing the compendious knowledge of the editor of the *Analyst*, Dr. C. Ainsworth Mitchell, who was present as president of the Medico-Legal Society and was an authority on such things as the detection of forgery and the examination of inks. The toast of Kindred Societies, proposed by Mr. Edward Hinks, a past-president, was responded to by Dr. R. H. Pickard, F.R.S., president of the Institute of Chemistry, and Dr. E. Mellanby, secretary of the Medical Research Council, who described himself as, at heart, a laboratory worker. The Master Cutler, Sir Samuel Roberts, a fellow citizen of the President, and Sir Harry Lindsay, director of the Imperial Institute, responded for the Guests, a toast proposed by Prof. W. H. Roberts.

Post-graduate Work in Aberdeen

A course devoted to endocrinology will be held at Marischal College, the Royal Infirmary, and the Royal Hospital for Sick Children, Aberdeen, from April 21st to June 18th. The lectures and demonstrations will be given at 3.15 p.m. on Tuesdays and repeated at the same time on Thursdays. Applications should reach the secretary of the University not later than April 15th.

Royal Society of Arts

The Thomas Gray prize of £100 for an invention "considered to be an advancement in the science or practice of navigation" has been divided between Mr. H. J. Buchanan-Wollaston, for his current meter, and Dr. F. W. Edridge-Green, F.R.C.S., for his colour perception lantern. The latter is an improved form of the Edridge-Green lantern used in the Navy and mercantile marine, and by railways, for ascertaining defects in colour perception.

Belt Memorial Fellowships

An election of junior fellows will take place in July. The fellowships are normally of the annual value of £400 and are usually tenable for three years. Some preference will be given to candidates proposing researches in mental diseases. Candidates should be prepared to begin work on Oct. 1st, and applications should be sent to Prof. T. R. Elliott, F.R.S., University College Hospital medical school, London, W.C.1.

Oto-rhinology in Austria

A second congress of Austrian ear, nose, and throat specialists will be held at Graz on June 12th and 13th. The principal subjects for discussion will be conservative and operative treatment of suppuration in the frontal sinuses and of laryngeal stenosis, metabolic disturbance in relation to diseases of the ear and the operative treatment of chronic suppurative otitis media. Further information may be had from Ernst Urbantschitsch, Schottenring 24, Vienna 1.

Incorporated Society of Chiropodists

The annual convention of this society will be held at the Langham Hotel, Portland-place, London, W., on Friday and Saturday, March 20th and 21st. During the course of the meeting lectures will be given by Dr. H. W. C. Vines (bacterial virulence), Mr. C. Lambrinudi (mechanical disabilities of the foot), and Mr. T. Pomfret Kilner (the scope of plastic and reconstructive surgery). Further information may be had from the secretary of the society, 21, Cavendish-square, London, W.1.

University of London Animal Welfare Society

On Tuesday, March 17th, at 8 p.m., at Birkbeck College, Breams Buildings, London, E.C., Prof. Walter Garstang, emeritus professor of zoology in the University of Leeds, will speak on the songs of birds. The lecture will be illustrated by gramophone and other instruments. Admission is free, without ticket.

The Sir Charles Hastings Lecture

This lecture was delivered on Tuesday evening in the hall of the British Medical Association by Prof. Winifred Cullis, the title being "Keeping Fit." Dr. R. Cove-Smith followed with a joint address on the same subject. Prof. Cullis discussing particularly the diet of children said that in artificially fed babies 70 per cent. were found recently to suffer from lack of vitamin C and iron, and added, speaking generally, that the diet of children should be varied but moderate, while every child should have at least a pint of milk a day. Dr. Cove-Smith was drastic in his criticism of modern habits. He regarded tobacco and alcohol as drugs and therefore not to be used indiscriminately; he described much restaurant food as "twice cooked mush"; he pointed to the risk to young people of dancing late into the night in overcrowded rooms from which they emerged inadequately clothed; he pointed out that the frequent use of baths at too high a temperature had its perils; and he coupled a commendation of the open-necked fashions in women's clothes with a denunciation of the too tight collar worn by many men. The chair was taken by Dr. Adolphe Abrahams, consulting medical adviser to the British Olympic athletic team, and both the deliveries making up jointly the Hastings lecture were vigorous and practical.

Mental After-Care Association

The annual meeting of this association will be held at the Stationers' Hall, Ludgate Hill, London, E.C., on Wednesday, March 18th, at 3 p.m., when the speakers will include Sir Hubert Bond, Dr. G. W. B. James, Dr. W. D. Nicol, Dr. J. F. E. Prideaux, and Dr. Reginald Worth.

King's College Hospital

A petition is to be presented to The King to continue the patronage to the hospital granted by previous sovereigns. Progress is being made here with the new nurses' home and private patients block. Expenditure last year had been very heavy and but for the exceptionally large legacies received during the year the deficit would have been much greater.

A Birmingham Welfare Centre

On Feb. 24th Mrs. W. A. Cadbury opened a new centre to extend the work of the public health, maternity and child welfare committee among the hundreds of families living on the Weoley Castle estate, Birmingham. At the new centre there are facilities for light meals and a class-room for instruction in cooking and nursery work.

Medical Diary

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, March 17th.

General Meeting of Fellows. 5.30 P.M.

Pathology. 8.15 P.M. for 8.30 P.M. Annual General Meeting. L. B. Holt: The Antitoxin Response to Varying Doses of Staphylococcus Toxoid. J. Patterson: The Quantitative van den Bergh Reaction and the Separate Evaluation of the Two Types of Pigment when present together in Serum. J. B. Duguid: Histogenesis of Experimental Tubular Nephritis. D. M. Pryce: Case of Tuberculous Arteritis. E. Hardy: Pneumococcal Septicæmia with Organisms in the Blood Film. A. B. Rosher: Streptothrix Morphologically Resembling *C. diphtheriæ*. B. H. E. Cadness: Case of Sickle-cell Anæmia.

THURSDAY.

Dermatology. 5 P.M. (Cases at 4 P.M.) Dr. H. W. Barber: 1. Leiomomata. Dr. G. B. Dowling: 2. Fox-Fordyce Disease. Dr. J. E. M. Wigley: 3. Pustular Psoriasis. Dr. J. Twiston Davies: 4. Case for Diagnosis: ? Kyrle's Disease. Dr. R. Klüber and Dr. Preudenthal: 5. Sections from Two Cases of Blue Nævi (Jadassohn). Dr. I. Muende: 6. Pringle's Adenoma Sebaceum. 7. Lichen Planus Simulating Pityriasis Rosea. Dr. G. Bamber: 8. Telangiectasia Hereditaria Hæmorrhagica. Dr. R. T. Brain: 9. Dermatolysis and Nævus Pigmentosus. 10. Urticaria Pigmentosa Dating from Birth.

Neurology. 8 P.M. Mr. Geoffrey Jefferson: Compressions of the Chiasma, Optic Nerves and Optic Tracts by Intracranial Aneurysms. Film (made by Dr. H. L. Gordon in Kenya) of Huntington's Chorea will be shown by Dr. C. Worster-Drought.

FRIDAY.

Radiology. 8.15 P.M. Report of the council of the section making recommendations to the General Medical Council as to the place of radiology in the medical curriculum. Dr. E. W. Twining and Mr. Hugh Cairns: Value of Radiology in Neurosurgery. Dr. M. H. Jupe, Mr. G. Jefferson, Mr. D. W. Northfield, and Dr. J. Purdon Martin will also speak.

HUNTERIAN SOCIETY.

MONDAY, March 16th.—8.30 P.M. (Simpson's Restaurant, Bird-in-Hand Court, 76, Cheapside), Dr. Adolphe Abrahams, Dr. C. S. Myers, F.R.S., and Dr. J. C. Bridgè: Fatigue.

ROYAL MICROSCOPICAL SOCIETY.

WEDNESDAY, March 18th.—4.30 P.M. (London School of Hygiene, Koppel-street, W.C.), Joint Discussion with Food Group of the Society of Chemical Industry on the Microscopy of Foods.

CHELSEA CLINICAL SOCIETY.

TUESDAY, March 17th.—8.30 P.M. (Hotel Rembrandt, Thurloe-place, S.W.), Mr. Hugh Cairns: Modern Cranial Surgery.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, Manson House, 26, Portland-place, W.

THURSDAY, March 19th.—8.15 P.M. (Royal Army Medical College, Grosvenor-road, Millbank, S.W.), Laboratory Meeting.

SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Thornhaugh-street, W.C.

FRIDAY, March 20th.—5.30 P.M., Prof. S. J. Cowell and Dr. G. C. M. McGonigle: Nutritional Factors in the Prevention of Disease.

Maternity and Child Welfare Group.—8.30 P.M., Dr. Eric Pritchard: Neonatal Mortality, its Causes, Prevention, and Treatment. Dr. Virginia Saunders-Jacobs will also speak.

EUGENICS SOCIETY.

TUESDAY, March 17th.—5.15 P.M. (Rooms of the Linnean Society, Burlington House, Piccadilly, W.), Mr. D. Caradog Jones: Eugenics and the Merseyside Inquiry.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.
TUESDAY, March 17th, and THURSDAY.—5 P.M., Dr. John Parkinson: Enlargement of the Heart. (Lumleian Lecture.)

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.
MONDAY, March 16th.—5 P.M., Dr. L. W. Proger: Specimens illustrating Tumours of the Kidney.

FRIDAY.—5 P.M., Dr. A. J. E. Cave: The Anatomy of Certain Vertebral Joints.

ROYAL INSTITUTION, 21, Albemarle-street, W.
TUESDAY, March 17th.—5.15 P.M., Prof. Edward Mellanby, F.R.S.: Drug-like Actions of some Foods.

INSTITUTE OF HYGIENE, 28, Portland-place, W.1.
WEDNESDAY, March 18th.—3.30 P.M., Dr. G. W. Theobald: Some Effects of Emancipation on the Health of Women.

CHADWICK PUBLIC LECTURE.
THURSDAY, March 19th.—5.30 P.M. (Royal United Service Institution, Whitehall, S.W.), Dr. Arthur MacNalty: Epidemic Poliomyelitis.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.
MONDAY, March 16th.—2.30 P.M., Dr. Gordon Holmes: Cerebro-spinal Syphilis. 3.30 P.M., Prof. F. J. Browne: Toxæmias of Pregnancy.

TUESDAY.—2.30 P.M., Dr. Leonard Colebrook: Puerperal Sepsis. 2.30 P.M., Dr. Janet Vaughan: Tests for Pregnancy.

WEDNESDAY.—Noon, Clinical and pathological conference (medical). 2.30 P.M., Clinical and pathological conference (surgical). 3.30 P.M., Mr. Aleck Bourne: Disproportion and Difficult Labour.

THURSDAY.—2.15 P.M., Dr. Duncan White: Radiological Demonstration.

FRIDAY.—3.30 P.M., Dr. R. E. Roberts: Radiology in Obstetrics. 5 P.M., Sir James Walton: The Surgical Aspects of Dyspepsia.

Medical clinics, surgical clinics or operations, obstetric and gynaecological clinics or operations daily from 10 A.M. to 4 P.M.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, March 16th, to SUNDAY, March 22nd.—ROYAL NATIONAL ORTHOPEDIC HOSPITAL, Great Portland-street, W. Post-graduate course in orthopaedics.—INFANTS HOSPITAL, Vincent-square, S.W. Mon., Wed. and Fri., 8 P.M., primary F.R.C.S. course in anatomy and physiology.—BROMPTON HOSPITAL, S.W. Mon., Tues., Wed., and Thurs., 5 P.M., special M.R.C.P. class.—ROYAL CHEST HOSPITAL, City-road, E.C. Mon., Wed., and Fri., 8 P.M., special M.R.C.P. class in chest and heart diseases.—MILLER GENERAL HOSPITAL, Greenwich-road S.E. Week-end course in general medicine.—Courses are open only to members of the Fellowship.

PRINCESS BEATRICE HOSPITAL, Richmond-road, S.W.
THURSDAY, March 19th.—8.45 P.M., Dr. B. Buckley Sharp: Demonstration of Cases. Mr. Kenneth Heritage: The Treatment of Prostatic Obstruction. Mr. A. Lawrence Abel: The Pavex Treatment of Vascular Disease. Mr. Abel: Surgical Travels in North America, illustrated by cinematograph films.

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, March 16th.—3.30 P.M., Dr. Symonds: Head Injuries (II.).

TUESDAY.—3.30 P.M., Dr. Grainger Stewart: Meningitis and Cerebral Abscess.

WEDNESDAY.—3.30 P.M., Dr. Kinnier Wilson: Clinical Demonstration.

THURSDAY.—3.30 P.M., Dr. Riddoch: Cerebral Tumours.

FRIDAY.—3.30 P.M., Dr. Denny-Brown: Neuritis. Out-patient clinic daily at 2 P.M.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL, N.W.
WEDNESDAY, March 18th.—1 P.M., Mr. A. Sorsby: The Ophthalmoscope in Cardiovascular Disturbances.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
WEDNESDAY, March 18th.—2 P.M., Dr. Reginald Lightwood: Survey of Pulmonary Tubercle. 3 P.M., Dr. A. Signy: The Value of the Mantoux Test.

Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

ST. JOHN CLINIC, Ranelagh-road, S.W.
FRIDAY, March 20th.—1.30 P.M., Demonstration of Chest Remedial Exercises for Asthma, Remedial Exercises for Sciatica, Rheumatic Diseases.

LEEDS GENERAL INFIRMARY.
TUESDAY, March 17th.—3.30 P.M., Dr. Cooper: Recent Developments in X Ray Therapy.

MANCHESTER ROYAL INFIRMARY.
TUESDAY, March 17th.—4.15 P.M., Mr. Harry Platt: Common Disabilities of the Foot.

FRIDAY.—4.15 P.M., Dr. C. S. D. Don: Demonstration of Medical Cases.

UNIVERSITY OF DURHAM.
SUNDAY, March 22nd.—10.30 A.M. (Newcastle General Hospital), Dr. E. B. Wright: Selected Cases.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION
WEDNESDAY, March 18th.—4.15 P.M. (Ophthalmic Institution), Dr. T. Stewart Barrie: The Red Eye.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED FEB. 29TH, 1936

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2386; diphtheria, 1200; enteric fever, 29; acute pneumonia (primary or influenzal), 1529; puerperal fever, 41; puerperal pyrexia, 126; cerebrospinal fever, 35; acute poliomyelitis, 5; acute poliomyelitis, 1; encephalitis lethargica, 4; dysentery, 77; ophthalmia neonatorum, 96. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on March 6th was 5194, which included: Scarlet fever, 968; diphtheria, 1033; measles, 1774; whooping-cough, 704; puerperal fever, 18 mothers (plus 14 babies); encephalitis lethargica, 283; poliomyelitis, 4. At St. Margaret's Hospital there were 25 babies (plus 13 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox, 2 (0) from enteric fever, 88 (20) from measles, 6 (0) from scarlet fever, 45 (10) from whooping-cough, 40 (6) from diphtheria, 68 (23) from diarrhoea and enteritis under two years, and 107 (17) from influenza. The figures in parentheses are those for London itself.

The mortality from influenza has varied but little during the present year, the total deaths for the last 13 weeks (working backwards) being 107, 119, 97, 85, 98, 104, 89, 110, 110, 80, 67, 62, 45. The deaths this week are scattered over 53 great towns, Birmingham reporting 9, Manchester 7, Croydon 5, no other great town more than 3. Liverpool reported 11 deaths from measles, Manchester 9, Salford 7, Birkenhead and Sheffield each 5, Bristol 4. Liverpool also reported 8 deaths from whooping-cough, Manchester and Birmingham each 5. Deaths from diphtheria were reported from 24 great towns: 5 from Manchester, 3 from Bradford, 2 each from Ilford, Leyton, Hull, West Hartlepool, and Birmingham.

The number of stillbirths notified during the week was 296 (corresponding to a rate of 45 per 1000 total births), including 52 in London.

Births, Marriages, and Deaths

BIRTHS

DEIGHTON.—On March 5th, at Cleethorpes, the wife of Dr. A. H. Deighton, of a son.

GIBSON.—On March 3rd, at Torquay, the wife of Paul C. Gibson, M.D. Lond., Torquay, of a son.

GLANVILLE.—On March 1st, at Devonshire-place, W., the wife of Dr. Reginald Glanville, Windsor Forest, Berks, of a daughter.

HALLEY.—On March 7th, at Ascot, the wife of G. Stiven Halley, M.D. St. And., of a son.

MARRACK.—On March 8th, at Bishop's Stortford, the wife of John Marrack, M.D. Camb., of a son.

PRYCE.—On March 3rd, at Welbeck-street, W., the wife of Dr. D. Merlin Pryce, of a daughter.

RHYS-JONES.—On March 3rd, the wife of Dr. Gwilym C. Rhys-Jones, of Dartford, of a son.

UPJOHN.—On March 4th, at Haverhill, Suffolk, to Dr. Margaret Carnegie Simpson, wife of F. H. Upjohn—a son.

MARRIAGES

JOLL—RAMSDEN.—On Feb. 29th, at St. George's, Hanover-square, Cecil A. Joll, M.S. Lond., F.R.C.S. Eng., of Harley-street, W., to Antonia (Toni), younger daughter of Mr. F. H. Ramsden, of Cambridge-terrace, W.

DEATHS

BANKS-DAVIS.—On March 5th, at Portman-street, W., Henry John Banks-Davis, M.B. Camb., F.R.C.P. Lond.

CLARKE.—On March 5th, at St. Albans, of pneumonia, Sidney Herbert Clarke, M.D. Camb.

CRAIG.—On March 8th, suddenly, at Littlehampton, Daniel Craig, M.D. Glasg.

DAVIS.—On March 3rd, at Brighton, Ivor Davis, M.D. Durh.

DOWDEN.—On March 3, at Edinburgh, John Wheeler Dowden, LL.D., F.R.C.S. Edin.

GIBBENS.—On March 1st, at Barking, Essex, Frank Edward Gibbens, M.R.C.S. Eng.

MAGILL.—On March 9th, at a nursing home in London, Sir James Magill, K.C.B., M.D., M.S., Q.V. Irel., M.R.C.S. Eng., Col., late R.A.M.C.

MENZIES.—On March 7th, at Farnborough, Henry Menzies, M.B. Camb., of Hobart-place, S.W.

SHEARER.—On March 7th, suddenly, Thomas Pitcairn Shearer, L.R.C.P. Edin., of Leicester, in his 79th year.

THOMSON.—On Feb. 27th, at Menton, Brevet-Col. Samuel John Thomson, C.I.E., C.B.E., I.M.S.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

PAINLESS DENTISTRY

A FEW weeks ago a report was widely circulated in the lay press announcing the discovery by Dr. Leroy Hartman, of Columbia University, of a sensitising solution by means of which the preparation of carious teeth for filling could be made painless in a few moments. It may be permitted to discount the somewhat sensational way in which the announcement was made and to believe that Dr. Hartman, who is a well-known dental surgeon in America, was not responsible for the flamboyant terms in which his discovery was made public. The solution consisted of thymol $1\frac{1}{2}$ parts, ether 2 parts, and 95 per cent. pure ethyl alcohol 1 part. The solution should be applied with cotton-wool to the dentine of the tooth to be filled and allowed to remain for $1\frac{1}{2}$ minutes for adults. It was claimed that this made the cavity preparation genuinely painless. We learn from newspaper reports that an unprecedented rush on chemists by American dentists has caused the supply of thymol to run short.

No doubt in this country many dental surgeons have felt it their duty to try this method, for although the manner of its announcement was not entirely calculated to dispel doubt, it would have been foolish to neglect any method which might render the use of the dental engine less unpleasant. Several letters have appeared in succeeding issues of the *British Dental Journal* which show that many have given Hartman's solution a trial with results on the whole unsatisfactory, though some have recorded successes. The varying results suggest that the psychical factor may not have been entirely absent, for there is no doubt that many patients are extremely suggestible where pain is concerned. An announcement that the marvellous new drug, guaranteed to make dentistry painless, was about to be tried, would doubtless be sufficient in many cases to make the patients believe that it was as effective in their case.

Topical applications to a carious cavity before cutting it out have long been used by dental surgeons and various drugs alone or in combination have been employed. The composition of Hartman's solution suggests that it may act by producing cold in the tooth. In so far as it does this there is no doubt that it would reduce pain. But it may be said of all drugs or preparations known to the dental profession that none of them can be relied upon to act as obtundents in every case. One of the best ways of making cavity preparation comparatively painless is by spraying a fine jet of cold water on the tooth to be prepared. In many cases, though not all, this will make a tooth so insensitive that it is possible to cut out the cavity without pain. Its disadvantage is that it requires the services of an assistant and is not very easily applied to back teeth.

Paraform, a polymer of formaldehyde, is a valuable obtundent. A minute quantity sealed in a carious cavity for a few days is often effective in reducing the sensitiveness. But it is a highly irritating drug and must be used with caution in case it brings about death of the dental pulp. For this reason it can only be used in shallow cavities. Eugenol, phenol, ethyl chloride as topical applications are all among the methods in use. They may have a temporary effect, always transient and frequently disappointing.

A local injection as used for the extraction of teeth is one of the best methods of rendering cavity preparation painless; but the anaesthesia may take some time to develop. A good result can usually be promised for front teeth, but for the molars the results are so variable as to rob this method of a good deal of its value. There is a natural tendency on the part of some patients to think that specific methods to relieve pain must be effective and that if they are not, the fault may be that of the dentist. While painless dentistry is still an ideal much can be done to diminish the pain attendant on the process of

filling teeth. Drugs have their place, but it still remains true that sharp instruments, a gentle touch, a sympathetic manner, and a clear knowledge of what has to be done are perhaps the most effective methods known to dentists of making conservative dentistry as little unpleasant as possible to the patient.

MORAL PROBLEMS IN HOSPITAL PRACTICE
BY ROMAN CATHOLICS

A WORK¹ which has the *Imprimi Potest* the *Nihil Obstat* and the *Imprimatur* of various Roman Catholic episcopal authorities is written for sisters in charge of hospitals who may at times be placed in sudden and grave doubts about the moral legitimacy of certain surgical operations. "The cases giving rise to these doubts," says the author, "are very often urgent cases and they not infrequently involve questions of life and death, and hence call for an immediate decision which the Sister finds it impossible to give in existing circumstances."

The conduct which is enjoined upon hospital sisters by Father Finney certainly may involve questions of what can broadly be described as hospital discipline. Thus, we are told that it is never lawful, even for medical or therapeutic reasons, to produce direct abortion, and that it is unlawful to sterilise a woman whose reproductive organs are normal but whose life might be threatened by diseases of other organs such as the heart, lungs, or kidneys, if she were to become pregnant. The book is written in the form of a series of questions and answers, the moral basis of which are expounded.

Q. 54.—"Has a Sister in charge of an operating-room the right to question a surgeon, as to the purpose of the work he is doing, in the course of an abdominal operation?" A.—"Yes, she has not only the right, but it is also her duty to question him, if she has reasonable grounds to suspect that he is doing something that is not morally lawful."

Q. 55.—"Has a Sister the right to question the surgeon, or tell him not to remove ovaries, or to do a complete hysterectomy?" A.—"Ordinarily a Sister has no right to tell a surgeon not to remove ovaries, or to do a complete hysterectomy, because if these organs are at all diseased, the surgeon must be the sole judge of what is to be done regarding their removal. However, if these organs are evidently healthy, and a Sister has reasonable grounds for suspecting that the surgeon is removing them for the purpose of sterilising the patient, the Sister has not only the right but the duty to question him."

Q. 56.—"If curettage is slated on the board, how is the Sister to know whether it is for the purpose of abortion or not?" A.—"This question is best answered by stating that a Sister in charge of an operating-room has a right to know, in advance, the exact nature of each operation that is to be performed. Therefore it should be an established rule, not only with regard to curettage, but with regard to any other operation, that a surgeon should state in advance to the Sister in charge of the operating-room the nature of the operation he intends to perform, at least as far as his diagnosis will enable him to do so."

In view of the fact that the views of the Roman Catholic church concerning the conditions which justify termination of pregnancy and sterilisation do not always harmonise with those which govern orthodox medical practice, it is possible to envisage that a difficult situation might arise in the course of an operation if Roman Catholic hospital sisters were invariably to perform their moral duty as specified in this book. The divergences of Roman Catholic moral teaching from orthodox medical

¹ Moral Problems in Hospital Practice. A Practical Handbook. Fifth edition. By the Rev. Patrick A. Finney, C.M.I., University of Dallas. London: B. Herder Book Company, 1935. Pp. 208. 6s.

teaching can be illustrated by the following questions and answers:—

Q. 8.—“If it is morally certain that a pregnant mother and her unborn child will both die, if the pregnancy is allowed to take its course, but, at the same time, the attending physician is morally certain that he can save the mother's life by removing the inviable fetus, is it lawful for him to do so?” A.—“No, it is not. Such a removal of the fetus would be direct abortion.”

Q. 34.—“In a case of ectopic pregnancy, in which the presence of the fetus is regarded as endangering the mother's life, is it lawful to remove an inviable ectopic fetus?” A.—“No, it is not lawful.”

A hospital sister's duties with regard to extraction of the fetus after the death of the mother and baptism may also be found surprising. They are governed by a principle stated by Dr. Austin O'Malley in the following words:—

“When we began to vegetate, our life began; we had a soul; and this as soon as the pronucleus of the spermatozoon fused with the pronucleus of the ovum, and made the first segmentation-nucleus. Before the first fission of that segmentation nucleus was completed into two distinct cells the soul was present, for that fission was independent life; and any life is impossible without a soul, or, what is the same thing, a vital principle. Since, moreover, the soul with the body is man, and since the process of vegetation in our present state is identical with that first cell-fission, this splitting primordial cell is a human being. The active primordial cell in this stage is as much a complete phase of human life as are the body and soul of a person at puberty, or at adult age.”

It follows from this statement that “if a mother dies during pregnancy, the fetus should be extracted by those upon whom this duty devolves.” . . . “The human embryo is distinguishable and has the form of a fetus as early as the end of the fourth week of gestation.”

This fourth provision of the canon is based upon the fact that the fetus often survives the mother who dies before delivery, and therefore nothing should be left undone to extract the fetus without delay, because, under the circumstances, there is nearly always a chance to administer baptism, and thereby secure eternal life for the fetus, and, in cases where the fetus has reached the term of viability, there is also a chance to preserve its temporal life. Regarding the operation for the extraction of the fetus, Father Ferreres writes as follows:—

“Since cases of apparent death are not uncommon in pregnant women, and since it is important—in order to secure the fetus alive—that the cesarean operation should take place as soon as possible, two points are to be borne in mind: (1) that there be certainty of the mother's death; (2) that the cesarean operation, or any other operation deemed necessary, be performed with the same caution and care as in the case of a living mother, so that, if alive, she may not be killed, as unfortunately has taken place more than once.” (“Death Real and Apparent,” pp. 38-39.)

The duty is also imposed of baptising an unborn child. The following instructions are given:—

Use a syringe which has been rendered aseptic and fill it with boiled water. If the membranes have not broken, they must be ruptured and the amniotic fluid discharged. The syringe is then carefully inserted in the vagina, and the water directed against the child's head, while at the same time you say the form of baptism. Do this without hurry, and be careful not to injure the parts. The water should be boiled and cooled to the temperature of the body before use. If the syringe is aseptic and the water boiled, there will be no danger of infecting the mother. If the os uteri be only partially dilated, it will be better to eject the water during “a pain.” If the os uteri be undilated, a valid baptism is practically impossible. As there is always a doubt with regard to the validity of intra-uterine baptism, in practice you should baptize again conditionally after it is born, pouring water on the

child's head and saying, “If thou are not baptized, I baptize thee in the Name of the Father, and of the Son, and of the Holy Ghost.” If the child's head is born, but not the rest of the body, and death is feared, you will baptize in the ordinary way, and conditional baptism will not be required afterwards. The umbilical cord is only a temporary part of the child, and baptism performed upon it is certainly invalid.

Difficulties may, however, arise as to the sister's duty in the event of an early miscarriage. The following instructions given by the Rev. John Fletcher are quoted by the author as authoritative:—

“If, however, the immature product of conception be passed, the question—and the most difficult question—is to determine whether it be living or dead. As every embryo has a rational soul, it follows that every fetus, prematurely expelled from the womb, should be baptized, if living; baptized conditionally (‘if thou are alive,’ etc.) if life be uncertain, and left alone if certainly dead. Make sure that what is passed is an embryo before you baptize it conditionally. Do not try and give the Sacrament to a large, decomposed blood clot, for instance. The ovum varies in size according to its age, and is generally covered with its membranes when expelled. If passed covered with the membranes, these must be quickly opened, and the fetus baptized conditionally. If small, it may be baptized by immersion. Place it in a small bowl of water, rupture the membranes with your thumb and forefinger, and at the same time say, ‘If thou art alive, I baptize thee,’ etc., and take it immediately out of the water. The advantage of this method is that you lose no time, and you have not to search for the head. With regard to abnormal fruits of conception, these misfortunes are fortunately very rare and die soon after birth. If they possess a head and breast, they should be baptized. Unless there be immediate danger of death, leave the question of baptism to the priest.”

In addition to the above, the Rev. John Fletcher, from whom Father Patrick Finney here quotes gives the following note:—

“In cases of intra-uterine baptism, by a decree of the Sacred Office, August 21, 1901, a solution of one part bichloride of mercury in 1000 parts of water is allowed, if the use of plain water would be dangerous to the mother—not unless danger be present. The author, in any case, prefers the boiled water recommended in the text.”

MASQUE OF SPRING

SPRING and its new fashions will be seen together in a “Masque of Spring” to be presented next week in the fashion theatre of Messrs. Derry and Toms of Kensington by a clever company of artistes recruited from Covent Garden and other theatres, who will dance, mime, and parade to incidental music by classic and modern British composers, in three scenes—Morning, Afternoon, and Night. The masque, with expert choreography and designs by Andree Howard, will be an ambitious attempt to present new fashions in an artistic setting, and the Westminster Hospital is indebted to Messrs. Derry and Toms for the generous offer of the proceeds of the first performance.

“SYNTROPAN IN SEA-SICKNESS.”—Several inquiries have reached us about the preparation mentioned by Prof. C. Stanton Hicks in his letter on the treatment of sea-sickness (THE LANCET, Jan. 25th, p. 226). We are informed that this preparation is not actually on the market, but the Hoffmann-La Roche Chemical Works Ltd. (51, Bowes-road, London, N.13) are willing to hand trial supplies free of charge to medical men who are specially interested, and, if need be, are in a position to execute orders from wholesale or retail chemists. The preparation is a combination of Syntropan and Sedormid, the latter being a widely used sedative belonging to the open-chain ureides. Syntropan itself, a synthetic drug primarily intended for the relief of spasm, is obtainable in the ordinary form of oral tablets of 1 c.cm. ampoules.

THE RISK OF DIRT

A NEW poster shortly to be issued by the Health and Cleanliness Council reproduces their slogan "where there's dirt there's danger" in an arresting manner. The secretary of the movement (5, Tavistock-square, London, W.C.) will be pleased to send specimens of the poster free of charge, together with particulars of an offer of supplies of posters for distribution. The affixing of these bills in conspicuous places in certain districts should be of public utility.

Messrs. J. AND A. CHURCHILL LTD. inform us that the London County Council have renumbered the houses in Gloucester-place and that in future all communications about their publications, including The Medical Directory, should be directed to 104, Gloucester-place, W.1.

Appointments

BARNETT, T. S. M., M.D. Melb., F.R.C.S. Eng., has been appointed Visiting Consultant Obstetrician for Portsmouth.
BELL, A. C. H., M.B. Lond., F.R.C.S. Eng., M.C.O.G., Assistant Obstetric Surgeon to the Westminster Hospital.
HUGHES, EDWARD, M.D. Liverp., D.P.H., Deputy Medical Officer of Health for Plymouth.
KERR, J. A., B.Sc. Birm., F.R.C.S. Eng., Hon. Surgeon to the Buchanan Hospital, St. Leonards-on-Sea.
TIPPETT, G. O., M.B. Lond., F.R.C.S. Eng., Surgical Registrar at the London Lock Hospitals.
London Hospital.—The following appointments are announced:
NELSON, H. P., M.D. Camb., F.R.C.S. Eng., Hon. Assistant Surgeon;
BROWN, A. I. PARRY, M.B. Lond., D.A., Hon. Assistant Anaesthetist; and
COOPER, AUSTIN, M.D. Dub., Consulting Anaesthetist.
Queen Charlotte's Maternity Hospital.—The following appointments are announced:
HARBUTT, S. W. J., M.B. N.Z., Senior Resident Medical Officer;
WELLS, C. P. B., M.R.C.S. Eng., Assistant Resident Medical Officer;
KARRAN, C. W. C., M.B. Camb., District Resident Medical Officer;
FORSTER, D. I., M.R.C.S. Eng., Resident Anaesthetist and District Resident Medical Officer; and
OLDFIELD, J. M., M.R.C.S. Eng., Resident Anaesthetist.
Certifying Surgeons under the Factory and Workshop Acts:
DR. J. T. GRASSIE (Cheltenham District, Gloucester);
DR. G. I. GRIFFITHS (Bangor District, Caernarvon); Mrs. E. A. HUGHES, M.D. Lond. (Ruthin District, Denbigh).

Vacancies

For further information refer to the advertisement columns

Aberdeen Royal Infirmary.—Surgical Registrar. £200.
Aberdeen Royal Mental Hospital.—Asst. Physician. £300.
Altrincham General Hospital.—Sen. H.S. At rate of £150.
Aylesbury, Royal Buckinghamshire Hospital.—Second Res. M.O. £150.
Beckenham, Bethlem Royal Hospital, Monks Orchard.—Two Res. H.P.'s. Each £175.
Birmingham, Erdington House.—Deputy M.O. £800.
Birmingham, Little Bromwich Hospital for Infectious Diseases.—Jun. Res. M.O. £300.
Blackburn County Borough.—Asst. M.O.H. and Asst. School M.O. £600.
Bristol City and County, Child Guidance Clinic.—Psychiatrist. At rate of £500. Also Social Worker. £275.
Canterbury, Kent County Mental Hospital, Chartham Down.—Med. Supt. £1000.
Cardiff, King Edward VII. Welsh National Memorial Association.—Res. Asst. Tuber. M.O. £500. Res. M.O. £350. Also Asst. Res. M.O. £200, for Sully Hospital, Glam.
Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Hon. Third Assts. to Out-patient Dept.
Charing Cross Hospital.—Registrar to Nose, Throat, and Ear Dept. £100. Also Hon. Clin. Asst. to Dermatological Dept.
Chelsea Hospital for Women, Arthur-street, S.W.—Surgeon for Ear, Nose, and Throat.
Cheshire, Institution for Mental Defectives, Cranage Hall.—Res. Med. Supt. £800.
Chester, Barrowmore Hall, Great Barrow.—H.P. At rate of £150.
Chester Royal Infirmary.—H.S. £150.
Derby, Brebley Hall Orthopaedic Hospital, near Burton-on-Trent.—Asst. M.O. and Res. H.S. Each at rate of £150.
Devonbury and District General Infirmary.—Second H.S. £150.
Dewsbury, Infectious Diseases Hospital.—Res. M.O. £200.
Durham County Council.—Asst. Welfare M.O. £500.
Eastbourne, Princess Alice Memorial Hospital.—Res. H.S. £150.
Eastbourne Royal Eye Hospital, Pevensey-road.—H.S. £100.
Elizabeth Garrett Anderson Hospital, 144, Euston-road, N.W.—Hon. Clin. Assts. Also Hon. Asst. Obstetrician.

Evelina Hospital for Sick Children, Southwark, S.E.—Dental Surgeon. Also H.S. At rate of £120.
Great Western Railway Medical Fund Society, Swindon.—Chief M.O. £1200.
Great Yarmouth General Hospital.—H.S. £140.
Guildford, Royal Surrey County Hospital.—Res. Surg. O. £250.
Harrow Urban District.—Asst. M.O. £800.
Hospital for Sick Children, Great Ormond-street, W.C.—Res. H.P. and Res. H.S. Each at rate of £100.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.S. At rate of £75.
Huddersfield County Borough.—Asst. M.O.H. £500.
Huddersfield Royal Infirmary.—H.P. and Res. Anaesthetist. Also H.S. Each at rate of £150.
Ilford, King George Hospital.—H.P. and two H.S.'s.
Institute of Ray Therapy, Camden-road, N.W.—Part-time M.O. At rate of £100.
Isolation Hospital, Muswell Hill.—Res. M.O. £400.
Kent Education Committee.—Asst. M.O. £500.
Kent and Canterbury Hospital.—Hon. Dermatologist.
King's College Hospital, S.E.—Asst. Surg. and Asst. Orthopaedic Surgeon.
Lancaster County Mental Hospital.—Asst. M.O. £500.
Liverpool Sanatorium, Delamere Forest, Frodsham.—Second Asst. to Med. Supt. £200.
London County Council.—Two Asst. M.O.'s (Grade I). Each £350. Four Asst. M.O.'s (Grade II). Each £250. Also five Temp. District M.O.'s. £300-£100.
London Lock Hospitals.—Two Res. M.O.'s. One for Male Dept. One for Female Dept. Each at rate of £175.
London University.—University Chair of Biochemistry. £1000. Also University Readership in Anatomy. £600.
Macclesfield General Infirmary.—Second H.S. At rate of £150.
Manchester, Ancoats Hospital.—H.S. At rate of £100.
Manchester, Withington Hospital and Institution.—Jun. Asst. M.O. At rate of £200.
Mansfield, Harlow Wood Orthopaedic Hospital.—Two H.S.'s. At rate of £200.
Mount Vernon Hospital, Northwood, Middlesex.—Asst. Radiologist. £350.
Newport, Mon. Royal Gwent Hospital.—Cas. O. At rate of £175. Asst. Cas. O. Also two H.S.'s and H.P. Each at rate of £135.
Northumberland County Council.—Asst. County M.O.H. £500.
Norwich, Jenny Lind Hospital for Children.—Res. M.O. £120.
Nottingham General Hospital.—H.P. At rate of £150.
Paddington Green Children's Hospital, W.—H.P. and H.S. Each at rate of £150.
Plymouth, Prince of Wales's Hospital, Greenbank-road.—H.S. At rate of £120.
Port Said, British Hospital.—Principal M.O. £700.
Preston and County of Lancaster Royal Infirmary.—H.P., Cas. H.S., also H.S. Each at rate of £150.
Princess Beatrice Hospital, Earl's Court, S.W.—Hon. Anaesthetist.
Princess Louise Kensington Hospital for Children, St. Quintin-avenue, W.—Clin. Asst. for Out-patient Dept.
Rochdale Infirmary and Dispensary.—Second H.S. £150.
Rotherham Hospital.—Cas. H.S. £150.
Rotherham, Oakwood Hall Sanatorium.—Asst. Res. M.O. £250.
Royal Chest Hospital, City-road, E.C.—Clin. Assts.
Royal Northern Hospital.—Asst. Pathologist. £500.
Royal Waterloo Hospital for Children and Women, S.E.—Hon. Asst. Orthopaedic Surgeon.
St. Albans, Hill End Hospital for Mental and Nervous Disorders.—H.P. At rate of £165.
St. Andrew's Hospital, Devons-road, Bow, E.—Asst. M.O. £350.
St. Mary's Hospital, W.—Med. Reg. £200.
Salford Royal Hospital.—Hon. Asst. Physician.
Salisbury General Infirmary.—H.S. At rate of £125.
Sheffield Children's Hospital.—H.P. At rate of £100.
Sheffield University, Dept. of Bacteriology.—Jun. Asst. Bacteriologist and Demonstrator. £300.
Southampton, Isolation Hospital and Sanatorium.—Jun. Res. M.O. £200.
Southend-on-Sea General Hospital.—Obstet.-Reg. £125. Also H.S. At rate of £100.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—Radium Officer. £500.
Taunton and Somerset Hospital.—H.S. At rate of £100.
Tottenham Diagnostic Clinic.—Gynaecologist. £125.
University College Hospital, Gower-street, W.C.—Asst. Radiologist. £200.
University College Hospital Medical School, W.C.—Jun. Fellows for Beit Memorial Fellowships. Each £400.
Uxbridge, Hillingdon County Hospital.—Jun. Res. Asst. M.O. At rate of £250.
Walsall, Manor Hospital.—Jun. Res. Asst. M.O. £150.
West Bromwich and District General Hospital.—Cas. O. At rate of £200.
Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. and Jun. Res. H.S.'s. At rate of £150 and £100 respectively.
West London Hospital, Hammersmith-road, W.—H.P. and H.S. to Spec. Depts. and Res. Cas. O. Each at rate of £100. Non. Res. Cas. O. £250. Also Physician.
West Sussex County Council, &c.—Asst. County M.O.H., &c. £800.
Wigan, Royal Albert Edward Infirmary and Dispensary.—H.S. At rate of £150.
Willesden General Hospital, Harlesden-road, N.W.—Res. Cas. O. At rate of £100.
York County Hospital.—H.S. to Eye, Ear, Nose, and Throat Dept. £150.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Pontesbury, Salop.

Medical Referee under the Workmen's Compensation Act, 1925, for the Halifax County Court District (Circuit No. 12). Applications should be addressed to the Private Secretary, Home Office, Whitehall, London, S.W.1, before March 28th.

ADDRESSES AND ORIGINAL ARTICLES

MEDICAL PROBLEMS IN MINERAL METABOLISM*

BY R. A. McCANCE, M.D., Ph.D. Camb.,
F.R.C.P. Lond.

ASSISTANT PHYSICIAN IN CHARGE OF BIOCHEMICAL RESEARCH,
KING'S COLLEGE HOSPITAL, LONDON

I.—LEGACIES OF EVOLUTION

"That the physician of another age will be as familiar with the operations of the animal economy as he is at present with its anatomy I have not the least doubt and . . . I will venture to predict that what the knowledge of anatomy at present is to the surgeon, in conducting his operations, so will chemistry be to the physician in directing him generally, what to do and what to shun; and, in short, in enabling him to wield his remedies with a certainty and precision of which in the present state of his knowledge he has not the most distant conception."⁶⁶

THE words are those of William Prout, Goulstonian lecturer in 1831. That prophesy was a bold one to make over one hundred years ago, but I think it has been justified by the events of the last few years. Chemistry is one of the "growing points" of medicine to-day, and I make no apology that my subject is a biochemical one. You have heard from recent Goulstonian lectures something of the metabolism of calcium, phosphorus,⁴⁰ and iron.¹⁰⁷ My theme is also one of mineral metabolism, and while I propose to say something of the above elements in my first lecture, I hope to deal mainly with the importance of sodium in physiology and medicine.

The minerals in the world to-day are those which were there when life began. Their properties have not changed in any way. As life evolved some twenty or thirty of them have been incorporated into living matter, some in very small amounts, and this "mineral basis of life"⁹¹ is one of the most interesting aspects of evolution. Some elements are almost universally present in living matter; others—e.g., vanadium and cadmium—only seem to have been used by one or more families. Sometimes the same element has been used to fill many functions, sometimes the same function has been served by two or more elements. Our own mineral metabolism is the legacy of the ages. We can only appreciate it by a study of the past.

The Mineral Background of Evolution

CALCIUM AND IRON

Puzzling and diverse as some of the functions of the elements seem to be, their chemical properties must govern and have always governed their biological behaviour. Of the six metals (sodium, potassium, calcium, magnesium, iron and copper) commonly present in living matter in considerable quantities, calcium is the one with the greatest tendency to form insoluble salts. The carbonate, phosphate, oxalate and stearate at once come to mind. Now of these the carbonate and phosphate have been very widely used as hardening agents, the former by the invertebrates for their protective exoskeleton, the latter by the vertebrate phylum for their bones and teeth. Birds have utilised both

the phosphate and carbonate. On the other hand calcium is not the only biological metal with insoluble salts. Sodium and potassium form none, but iron possesses an insoluble phosphate and some of the organic phosphate esters have iron salts which are quite insoluble even in hydrochloric acid. Very insoluble forms of ferric oxide are also known. There is therefore no theoretical reason why iron should not have been adopted as the universal hardening agent, although its scarcity is a sufficiently practical one. It has as a matter of fact been so used by some of the marine invertebrates, and this is a beautiful example of Nature's ability to solve a similar problem in two quite different ways. The radular teeth of the Chitonidæ contain ferric oxide embedded in a stroma of unproven nature, and the Patellidæ also possess teeth so impregnated with this same insoluble ferric oxide that beautiful X ray photographs can be taken of them.⁴⁴ These animals are particularly interesting because they illustrate the use of another hardening agent, silica, which has been extensively used by the sponges and other lower forms of marine life, but which has found no place in the structure of the vertebrates. Their central teeth consist of a siliceous framework, packed with ferric oxide, which is so insoluble that it can only be removed by prolonged heating with concentrated hydrochloric acid.

There is some evidence that calcium and iron may be biologically associated—but not of course in all their functions. Iron is a constant impurity in marine shells,^{13 51} and there is evidence that iron may be present in normal and pathological calcification.¹⁰⁸ Ramage et al.^{67 70} have found that in the livers of fetuses and young animals there is a tendency for iron and calcium to rise and fall together. In hæmochromatosis also there may be some associated disturbance of calcium metabolism.^{69 92 93} On the other hand calcium is not apparently necessary for life even in highly developed forms. Lower plants containing no chlorophyll may be successfully grown on calcium-free media, and it has recently been shown that *Drosophila*, a fly, may have 99 per cent. of its calcium removed without loss of function. This interesting work of Rubinstein et al.⁷⁹ on yeast and *Drosophila* show how unwise it is to generalise from the frog or mammal as to the rôle of ions in neuromuscular physiology.

The very property which makes an element so invaluable in one respect may make it a source of difficulty or even danger in another. I need not recall to you the way in which insoluble calcium salts form concretions in the urinary and biliary systems, the salivary ducts and other embarrassing situations. That iron does not do so also is, I think, only due to the fact that so little free iron is present in the body fluids.

There can be no doubt that the development of a satisfactory method of excreting these elements with insoluble salts must have been a *sine qua non* of evolutionary survival. In considering evolution we are inclined to think anatomically. Thus loss of shell is a frequent event in the evolution of some of the invertebrate phyla. We regard it as a commonplace, but just consider for a moment what a strain must have been thrown on the mechanisms for excreting calcium when such an evolutionary step occurred. Many species have managed it successfully, but I feel sure that the calcium metabolism of allied species with and without shells would prove

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* The Goulstonian Lectures for 1936, delivered before the Royal College of Physicians of London on March 5th, 10th, and 12th. Lects. II. and III. will appear in forthcoming issues of THE LANCET.

an interesting study. I have found, for example, that one of the nudibranchs (*Archidoris britannica*) contains 2 per cent. of calcium. This is not organised into any useful structure but seems to be present throughout the tissues in the form of the carbonate, which forms 20 per cent. of the total dry weight of the animal. I believe that this may well be the result of inefficient excretion coupled with the loss of the power to form a shell. I venture to suggest that man would never have been evolved at all if the early mammals had not acquired the property of excreting almost all their unwanted calcium by the bowel, where the insolubility of its salts could not cause mechanical obstruction.

The insolubility of so many of the calcium salts may be a source of danger for another reason, for it may prevent enough of the food calcium being absorbed to supply the needs of the animal. Excess of inorganic phosphates may do this, especially if the stomach juices are not acid. The masses of fatty acids which pass through the gut in sprue and celiac disease without being absorbed bind calcium as the insoluble soaps⁸⁰ and prevent its absorption. The calcium in spinach is said to be quite unavailable²⁴ because of the excess of oxalic acid present in this plant. I think it quite likely that there may be enough oxalic acid in a helping of rhubarb or strawberries to immobilise all the calcium eaten at that meal.

There is no doubt that the physiological and pathological chemistry of calcium is largely bound up with that of the associated ions. Consider for example the extraordinarily low serum calciums which have been recorded in chronic interstitial nephritis^{81 101} and which are almost certainly secondary to the high levels of inorganic phosphate which are met with in that disease.⁸⁰ Concretions form because free fatty acids, or bile-pigments, or phosphates, accumulate and precipitate themselves out with the calcium which is universally present. I will give you what I consider to be a good example of this. In the rare disease known as calcinosis plaques of calcium phosphate accumulate beneath the skin. They are sometimes surrounded by fluid. I have had the opportunity of examining one of these cases in which fluid was withdrawn on two occasions within a few weeks of each other. The results of the chemical examinations are shown in Table I., and you will

TABLE I
Ca/P. Ratios in Calcinosis Fluid

	First withdrawal.	Second withdrawal.
Calcium ..	580 mg./100 c.cm.	123 mg./100 c.cm.
Phosphorus ..	260 mg./100 c.cm.	227 mg./100 c.cm.
Ca/P. ratio ..	2.22	0.54

see that on the first occasion the calcium and phosphorus were present in large amounts and in the ratio in which they are found in bone, while on the second the fluid was rich in phosphorus but contained relatively little calcium. I conclude that the calcium had not yet had time to accumulate, for I believe from other examinations of internal deposits which I have made that calcium would have been deposited until a calcium/phosphorus ratio approaching that of bone had been achieved.^{102 103}

IRON AND COPPER

We do not know whether iron was a part of the first globule of living matter or not, but we do know that it is one of the most important elements in our own life processes. From the evolutionary and

medical points of view the relationships of iron and copper are most interesting. I need only refer to the fact that the latter is in some way essential for the synthesis of hæmoglobin in the higher animals.³ The two metals have chemical properties in common which have been adopted by Nature for oxygen transport. The two pigments hæmoglobin and hæmocyanin, the respiratory pigment of the arthropods and molluscs,⁴ contain iron and copper respectively. Both form an oxygen, a carbon monoxide and nitric oxide compound with the reduced metal, and an oxygen compound with the metal at its higher valency,⁷¹ so that functionally they are very alike. They seem to differ sharply, however, in the chemical nature of the group with which the metal is combined. In hæmocyanin this appears to be a sulphur compound with a peptide,⁷¹ and the narrow distribution of hæmocyanin may be due to the limitations of these essential prosthetic groups. In hæmoglobin on the contrary the iron is combined with a pyrrole derivative—porpherin—so that the problem of oxygen transport has been solved in two quite different ways, and we have the two metals serving the same function in virtue of the fact that they possess different prosthetic groups.

Now in addition to their share in oxygen transport porphersins seem to be of almost universal distribution, and, whereas iron is the metal commonly attached to them, copper porphersins are also found in nature. The best known of these have no respiratory function and form the colouring matter in the feathers of the South African bird turaco. On the other hand the iron porphersins are the great respiratory catalysts of the organic world, so that here we have the two metals combined with the same prosthetic group and serving different functions.

These iron porphersins seem to be present in every active aerobic animal and vegetable cell.⁴⁵ It is this iron complex in yeast with which cyanide combines.¹¹⁰

Iron is known to have many other functions. Yeast, which can only respire in the presence of organic hæmatin iron, can only ferment in the presence of inorganic, probably ferrous, iron.¹¹⁰ Inorganic iron, and to a less extent hæmatin iron, activate catalysts like glutathione³² and enzymes, and this metal has no doubt many functions of which we have not as yet got any conception. Why, for example, should the epithelial cells of the higher animals double their iron content quite rapidly at the close of the growth period, and thereafter maintain it at the higher level¹⁰⁹? We do know, however, that two forms of iron are present in every cell which depends upon oxygen for its respiration, and therefore that our food contains these two forms of iron. Are both equally valuable? This is a question which has received considerable attention in the last 10 or 15 years.

The Availability of Organic (Hæmatin) Iron in Nutrition

Whipple and Robschelt-Robbins¹⁰⁴ found that hæmoglobin was well utilised by anæmic dogs for blood regeneration when it was administered parenterally, but that only some 5-20 per cent. of it was so used when it was taken by mouth. Lintzel tried the experiment of adding 50 ng. of iron on one day to the diet of a man in iron equilibrium, and found that some 15-18 mg. of the metal were retained when it was given as the sulphate or chloride, but none when it was given as hæmoglobin. These are observations which can be supported on clinical grounds, for all are familiar with the way in which

very small but often recurring hæmorrhages into the gut can bring about a profound anæmia. Lintzel⁴⁹ has maintained rats for 4-6 weeks on an iron-free diet and to this diet added iron in various forms. Ferrous sulphate and the chloride were well retained and stored, but not so hæmoglobin iron. The bodies of the animals which had been given hæmoglobin contained no more iron in their bodies than the controls. Elvehjem, Hart and Sherman²¹ compared the rate of hæmoglobin regeneration caused by various foods with the amount of inorganic iron they contained, and found there was a close parallel. We may conclude therefore that iron in the organic tetrapyrrole form is a poor source of iron for the body, and it is most satisfactory and interesting that copper in this form should also have been shown to be quite unavailable.⁵² I think this unavailability must be due to the fact that mammals have never evolved a digestive ferment capable of setting free iron from these porpherin compounds. Lintzel, for example,⁵⁰ and others have shown that only some 5-10 per cent. of hæmoglobin iron can be set free by prolonged peptic and tryptic digestion *in vitro*, and that some of the iron in plants may also be most resistant to such treatment. Many attempts, mostly biological,^{76 76 77} have been made to determine the available iron in food. These tests are not easy to carry out, and yet it is clearly important to know the proportions of porpherin and ionisable iron in our daily diets.

L. R. B. Shackleton and I⁵³ have accordingly made a chemical survey of all the common foodstuffs eaten in this country and a synopsis of the results is given in Table II.

TABLE II
Available Iron in Foods

Expressed as a percentage of the total iron			
Beef muscle ..	8-28	Cereals ..	80-100
liver ..	80-100	Cabbage, lettuce, &c. ..	50-75
Chicken muscle ..	25-35	Legumes ..	70-95
Fish (white) ..	95-100	Tomatoes ..	50-80
„ (herring) ..	55-75	Plums ..	50-70
Eggs, hen ..	100	Apples and pears ..	80-100
Roe, herring ..	98	Grapes, raisins, &c. ..	86-96
		Nuts ..	60-95

You will notice that little of the iron in meat but nearly all the iron in liver, eggs, white fish and cereals is available. Most vegetables and many fruits fall into an intermediate category, but some fruits and nuts contain a very high percentage of their iron in available form. It follows at once from these figures that meat, for all the iron it contains, may be a poor source of the metal, and foods like eggs and brown bread are really as good although they do not contain so much total iron. Miss Widdowson and I have found that a person on a mixed diet, but eating over half a pound of meat per day, was taking in 22.1 mg. of iron per day of which only 9.3 mg. were available. A second person, who ate practically no meat, was only taking in 9.3 mg. of iron per day from the food, but 8.6 mg. of it was available. I think that in future we shall probably assess iron requirements on the basis of available rather than total iron.

Total and Available Iron in English Diets

I think I am right in saying that all surveys of British diets have been made by the "family" method, and that there are no records of the weighed food intakes of individual normal men and women. We know that the calorie requirements of women are very much less than those of men, but that the needs of the two sexes, expressed as calories per kilogramme of body-weight are more nearly the same. We

have no right to assume that these relative requirements of the two sexes apply to iron and other inorganic salts. We have every reason in fact to suppose that they do not. One has only to consider the drain of menstruation, pregnancy and lactation on women's stores of iron and calcium to realise that their needs for these minerals must be greater than men's.

Miss Widdowson and I¹⁰⁶ have carried out a survey by the individual method. We persuaded 63 men and 63 women of the middle classes to weigh all their food for a week, and from this data and our own food analyses we have worked out each individual's protein, fat, carbohydrate, calcium, iron and phosphorus intakes. We are only concerned for the moment with their iron intakes, which are summarised in Table III. Considering the total iron

TABLE III

Iron Intakes and Hæmoglobin Levels of Middle-class Men and Women

	MEN			WOMEN		
	Mean	Max.	Min.	Mean	Max.	Min.
Total iron mg./day ..	16.8	28.5	7.8	11.4	17.3	5.5
Total iron mg./kg. body-weight/day ..	0.24	..	..	0.18	..	..
Available iron mg./day ..	10.8	18.7	5.3	7.9	12.4	5.0
Available iron mg./kg. body-weight/day ..	0.16	..	..	0.13	..	..
Hæmoglobin percentage .	102	114	86	93	102	87

first you will observe that the average woman's intake was far below the man's, and the highest woman's figure only just exceeded the man's average. If you look at the intakes per kg. of body-weight you will see that even on this basis the women's intakes are well below the men's. This difference between the sexes is partly due to the higher consumption of meat by the men. The intakes of available iron per kg. of body-weight are more nearly the same, but there is still a balance in favour of the men which is simply explained by the greater amount of food eaten by them. This difference would not matter if all intakes were well up to or over the optimum, but this is not likely to be generally the case for many of these individual intakes are lower than the accepted American and English standards. At the same time there can be no serious iron deficiency among these people, for their average hæmoglobin levels were normal and the male/female ratio also normal.

When we began, however, to think over the so-called normal difference between the hæmoglobin levels of the sexes and to consider it in the light of their iron intakes and iron requirements, we could not help feeling that the difference might not be physiological after all, but pathological. We therefore administered 100 mg. of iron per day to a group of 31 normal men and women, mostly between 20 and 30 years of age. This treatment did not alter the hæmoglobin level in the men's blood but raised it without exception in the women's. The average increase was over 10 per cent., and the result of treatment was to leave the two sexes with almost the same average percentages of hæmoglobin. I think we must conclude that the hæmoglobin levels of normal women in this country are being limited by their low iron intakes. They would probably be better and fitter on larger intakes and this could, I think, be settled if a sufficiently comprehensive investigation was

undertaken. It would appear that men get enough iron for their physiological requirements in this country, but I think it possible that their rate of acclimatisation to high altitudes, which depends partly upon new hæmoglobin formation, may be controlled by their iron intakes.¹⁰⁶

Phosphorus

I turn now to another element, phosphorus, which I believe is essential to all living matter. It is the shortage of this element in sea water which limits the development of the plankton, upon which practically all animal life in the sea depends. I only propose to touch upon one very small aspect of phosphorus metabolism, and my real excuse for doing so is that it has been occupying my attention for the last 18 months.

In the course of their evolution the seed plants have developed the property of forming and storing large amounts of a substance called phytin. This is the calcium magnesium salt of inositol hexa-phosphoric acid. Inositol has the empirical formula $C_6H_{12}O_6$, and resembles the carbohydrates in having 6 -OH groups and a sweet taste, but differs from them in most other properties, particularly in possessing a cyclic structure. I suppose it is true to say that the efficiency of seeds depends to a large extent upon the fact that they contain the maximum amount of nourishment for the embryo combined with the minimum amount of moisture, and from this point of view phytin must be regarded as an almost ideal product, for it offers a means of storing carbon, hydrogen, phosphorus, calcium and magnesium in an inert and quite insoluble form.

In that the seeds of plants may form a very important part of man's diet, we have to consider the question of phytin in human nutrition. Many have assumed that the phosphorus calcium and magnesium are freely available, but there is plenty of evidence which suggests that they may not be. In the first place mammals have never evolved an intestinal enzyme capable of hydrolysing phytin and setting the phosphorus free in inorganic form,⁶³ and phytin itself is most unlikely to be absorbed without being hydrolysed. It is indeed easy to show that 25 to 65 per cent. of ingested phytin is excreted unchanged. I myself ate a pound of Hovis bread every day for 10 days which meant that I was having about 430 mg. of phytin phosphorus per day (in addition to all the other wonderful things in brown bread!). I excreted just under 50 per cent. of this phytin phosphorus unchanged in my faeces and the remainder was probably destroyed by the bacteria in my large intestine.⁵⁴ We must conclude that phytin phosphorus is largely unavailable. In the second place, if phytin is not digested it may hold large amounts of calcium in the gut as the insoluble salt and so prevent the latter's absorption. In this way phytin, by being itself unavailable, may render calcium unavailable also.

It has often been claimed that cereals tend to promote rickets. Bruce and Callow⁹ suggested that this might be due to the phytin in the cereals. The whole question is a very open one at present,^{25 31 48} but it seemed to me that we ought to know how much phytin there was in human food, so Miss Widdowson devised a method of estimating it and Table IV. shows some of our results. You will see what a high percentage of the phosphorus in whole wheat and oats is in the form of phytin. White bread contains much less phytin, but also much less total phosphorus. Nuts contain large amounts of phytin

TABLE IV

Total and Phytin Phosphorus in Foods

Edible portions only have been analysed. Results are expressed on the basis of fresh or purchased weight.

	Total P.	Phytin P.	
	Mg./100 g.	Mg./100 g.	Per cent. of total P.
Cereals—			
Wholemeal flour ..	355	168	46
White ..	102	15	15
Hovis bread ..	211	80	43
Rolled oats ..	339	224	66
Nuts—			
Brazil nuts ..	592	133	22
Pea ..	365	210	58
Vegetables—			
Potatoes ..	31	6	19
Onions ..	30	0	0
Swedes ..	19	0	0
Carrots ..	20	3	16
Fruit—			
Apples ..	80	0	0
Bananas ..	23	0	0
Blackberries ..	26	4	16
Figs (dried) ..	91	12	13

phosphorus, but vegetables and fruits little or none. By applying these results to the dietary survey, to which I have already referred, we were able to find out how much total and phytin phosphorus people in this country were eating. The results are in Table V.

TABLE V

Total and Phytin P. Intake of Men and Women

	Men. (Mean of 63)	Women. (Mean of 63)
Total P. (g./day)	1.61	1.13
Phytin P. (g./day)	0.04	0.04
Non-phytin—i.e., available P. (g./day)	1.57	1.09
Available P. as percentage of total P.	98	97

You will see that in English diets phytin phosphorus forms a very small percentage of the total phosphorus. There are two reasons for this. Firstly, we derive a very large part of our phosphorus from meat, milk and other animal products which contain no phytin. Secondly, the majority in this country do not eat whole cereals but white bread, and, as you see in Table IV., this contains very little phytin. I think that in English diets phytin may almost be neglected. There is plenty of phosphorus in the food without it, and not enough of it to be a real danger to calcium absorption. It may be quite otherwise with native diets in which maize, millet, &c., form the bulk of the food. In them half the total phosphorus ingested may be unavailable, and possibly the calcium as well.

The Alkali Metals, Sodium and Potassium

I wish now to turn to other aspects of mineral metabolism and say something of the importance of sodium and potassium. All the common salts of these metals are freely soluble. While this normally ensures complete absorption from the intestine it carries with it certain disadvantages, for there is no way in which the body can store reserves of these elements in an insoluble and inactive form. Although so much alike chemically and physically sodium and potassium fulfil quite different biological rôles, for animals and plants have universally adopted potassium as the main cellular base and sodium as the

extracellular ion. The cell membranes once formed seem to be almost impermeable to these soluble kations, so that cells bathed in a medium rich in sodium may contain none of this element. It has been shown experimentally that one of the marine diatoms, and possibly some of the seed plants, can substitute rubidium for potassium in cellular growth,⁹⁹ so that potassium may not be essential for life in its general sense. Higher animals must have potassium, although rubidium is an element commonly found in traces in living cells.⁹⁴ Zwaardemaker¹¹¹ showed that uranium could replace potassium in fluids used to maintain the frog's heart beat. I do not think that the possibilities of potassium substitution in animals or plants have been fully explored.

Since sodium has been adopted as the main extracellular base, vertebrates and invertebrates with elaborate extracellular circulatory systems must contain considerable amounts of this element, and obtain it from their food. With no reserves to draw upon a constant supply is important, and although periods of deficiency can be survived if excretion can be cut down to a minimum, the moment the rate of excretion is forced up large amounts must be supplied or the most serious consequences will ensue. Plants, which have no such extracellular systems, may contain practically no sodium. Some insects also⁷⁹ appear to be able to thrive on minimal amounts of this element. *Drosophila* for example can flourish when 95 per cent. of the sodium in its body has been removed, and possibly may be able to do without any at all. The discovery that such a highly organised creature as *drosophila* can do without sodium is an extraordinarily interesting one. It is fully as significant theoretically, although not perhaps so important economically, as for example the discovery that sheep require cobalt.⁶³

been developed in recent years for studying it. These consist essentially in methods of differentiating the function of the glomeruli and tubules. There have been several interesting developments. It has been found possible in frogs and snakes to insert a cannula into a single intact glomerulus and withdraw the glomerular fluid for analysis. In this way it has been shown that in the frog, *necturus*, and snake^{59 74} the fluid filtered off in the glomeruli resembles plasma closely in composition except that it contains no protein. It does contain sugar, urea, chlorides and phosphates in the concentration in which they occur in plasma. Since the normal urine of these animals contains no sugar, reabsorption of this substance and water must take place in the tubules. Owing to the double blood-supply of the frog's kidney it is also possible to perfuse the tubules through the renal portal vein without perfusing the glomeruli. In this way it has been shown that the tubules of the frog's kidney do not excrete soluble sugars such as xylose, which readily pass into the urine of the intact animal.⁸⁸ The inference is that these sugars are filtered off in the glomeruli of the intact animal. This conception of the function of the tubules and glomeruli is very much supported by the study of the secretion of urine in glomerular and aglomerular fish.^{56 57 58} The glomerular fish excrete xylose readily and other soluble foreign substances such as thio-urea and inulin. Glucose appears in their urine if they are given phloridzin. The aglomerular fish do not excrete xylose, sucrose or inulin⁹⁰ and do not get glycosuria after phloridzin. This evidence all strongly suggests that the function of the glomeruli is to filter off all the soluble constituents of plasma, and that water and some soluble substances—e.g., glucose—are reabsorbed by the tubules. The aglomerular fish, however, can excrete creatinine, so that the tubules of these animals have also an excretory function.

If we knew of some substance which was freely filtered off in the glomeruli so that its concentration in the glomerular fluid was equal to that of the plasma, and if we knew that this substance was not reabsorbed or excreted by the tubules, we could use it as a measure of glomerular filtration. Then, by comparing its rate of excretion with that of other substances, we could find out how the latter were being dealt with by the kidney. This method is applicable to mammals and man, and much of the work of the last ten years on the secretion of urine has been devoted to the search for such a substance. Rehberg, I think, first suggested that creatinine might be used for this purpose in man. He took creatinine by mouth to raise the plasma concentration and estimated the plasma and urine concentrations and the volume of urine secreted in unit time. Now the volume of fluid filtered off in the glomeruli per minute

$$= \frac{\text{percentage of creatinine in urine}}{\text{percentage of creatinine in blood}} \times \text{vol. of urine per min.}$$

You will at once recognise that this formula is the same as that giving what is otherwise termed the creatinine clearance. Creatinine has been accepted by a number of continental workers, often without question, as a true measure of glomerular filtration.^{5 6 7 8 11 19 22 23 27 30 39 41 47 64 65 108}

Some have produced experimental evidence in its favour in the following way. Phloridzin has been known for a long time to lead to glycosuria, and, taking all the evidence together, phloridzin may be assumed to abolish the reabsorption of glucose in

TABLE VI

Sodium Content of Some Common Foods

	Mg./100 g.		Mg./100 g.
Meat	65-80	Cereals	5-30
Milk	43	Potatoes	3-4
Eggs	185	Vegetables—	
Organs—		Green	3-15
Liver, brain, kid-		Root	10-60
ney, &c. ..	110-160	Fruit	0-3
Fish	120-190	Nuts	2-10

Average human intake/day: 3000-6000 mg.

Table VI. shows the amount of sodium in a number of common food materials. You will notice how little some of them contain, and appreciate that additional salt may be an absolute necessity when I tell you that I would have to eat more than twice my own weight of potatoes every day to get my physiological intake of sodium. Men were mining for salt 4500 years ago at Igidir.⁸⁰ It is in hot climates where sweating is more or less continuous that salt becomes such a very important article of diet. A man may lose 3000-4000 mg. of sodium in a day by sweating, and a study of Table VI. will show that cereals without added salt would be a most inadequate diet.⁵²

Water Regulation

THE FUNCTION OF THE GLOMERULI AND TUBULES

The water regulation of the body is undoubtedly one of the key problems of comparative physiology, and it is intimately linked with the metabolism of sodium and potassium and the evolution and function of the kidney.

I cannot discuss water regulation or the metabolism of sodium without some reference to the function of the kidney, and the methods which have

the tubules. Govaerts and Cambier^{28 29} and Poulsson⁶⁴ therefore compared the clearances of glucose and creatinine in fully phloridzinised animals and found them to be the same. These experiments were done on dogs, and the results were assumed to apply to man. More recent work has shown that this is probably not the case (*vide infra*).

Nevertheless there is a great deal to be said against the indiscriminate use of creatinine as a measure of glomerular filtration.¹⁸ In the first place it is excreted by the aglomerular fish, so that somewhere in the scale of evolution creatinine was actively excreted by the tubules. In the second place the rate of excretion of creatinine may be,¹⁵ but apparently is not invariably, directly proportional to the plasma concentration, which is a *sine qua non* of any substance used to measure glomerular filtration.^{35 84 85 86}

In connexion with some work on the absorption of sugars from the intestine, McCance and Madders⁵³ suggested in 1930 that the pentose sugars might be used as measures of glomerular filtration. These non-metabolised sugars were later independently suggested and investigated in the United States. At first the American investigators accepted these sugars as true measures of glomerular filtration.^{12 14 42 43 62 88 89} They found, as has Cope,¹⁶ that their clearances were below that of creatinine, and they therefore considered that the latter was to some extent excreted by the tubules. They also found that after phloridzin the clearances of glucose and the non-metabolised sugars were the same. Höber, however, reported that xylose was reabsorbed to a small extent by the frog's tubules, and if this is true of other animals these sugars cannot give a true measure of glomerular filtration.

The latest compound to be used to measure glomerular filtration rate is inulin. This is a polysaccharide with a molecular weight of 1000-4000, and therefore most unlikely to diffuse readily out of the tubules or to be reabsorbed. It is freely soluble in water and filtered off in the glomeruli. This substance has been used by Shannon and his collaborators,^{84 86 90} who now admit that the pentose sugars and cane sugar are all reabsorbed to some extent and do not give an absolute measure of glomerular filtration. Inulin apparently is perfectly satisfactory. Glucose and other sugars may only be used if reabsorption has been blocked by phloridzin. Creatinine may be used in the dog^{73 86 87 105} but not in the fish, in which it is actively excreted by the tubules, nor in man, in whose tubules some active excretion also appears to take place.⁸⁵

All methods of measuring glomerular filtration suggest that large amounts of fluid must be filtered off there—between 100 and 150 c.cm./min. in a normal man. Since the normal rate of urine secretion is only about 1 c.cm./min., 99 per cent. of the water in the glomerular filtrates must be reabsorbed.

THE WATER REGULATION OF MARINE ANIMALS

As already stated, cell membranes, except those of the glomeruli and capillaries, are not ordinarily permeable to cations. They are, however, freely permeable to water so that cells are subject to the laws of osmotic pressure. These statements are as true of the complicated multicellular organism as they are of its individual constituent cells. We know, for example, that fish have a more or less constant mineral composition, and yet experiments with heavy water have shown that equilibrium between the water inside and outside of a small

living fish is attained in an hour.³⁶ Now all vertebrates at the present time have an osmotic pressure very much greater than that of fresh water, but very much less than that of the sea. It is now thought that they were evolved in fresh water.^{95 96} However that may be, all the water swallowed by a fish living in fresh water tends to dilute the plasma, and water must also be absorbed through the gills. Their glomerulo-tubular kidneys deal effectively with this. The high rate of glomerular filtration offers a ready means of separating water from the blood. The tubules reabsorb glucose, the necessary salts, and some water. The excess, which is excreted, results in the passage of a very dilute (hypotonic) urine. As the seas became more salt or as the free swimming vertebrates made their way into more saline waters, the whole situation changed. The environment became more concentrated than the tissue fluids. Thus instead of water passing into the fish there was a tendency for the water to pass outward through the gills, and for the animal to become desiccated. This could have been corrected by the production of a sufficiently concentrated urine, but the marine fish have never evolved the power to secrete a urine more concentrated than their plasma, and solved the problem of their water regulation in other ways^{95 96} (see later). Mammals can secrete a hypertonic urine, and this ability seems to be associated with the introduction of the so-called loop of Henle into their kidneys and the elaboration of a hormone in their posterior pituitary.¹⁰ Different species of mammals possess the power to secrete a hypertonic urine to very different degrees. Thus man can undoubtedly produce a urine much more concentrated than his plasma but not sufficiently concentrated to allow him to use sea water as his natural beverage.

"Water, water, everywhere
No any drop to drink."

We may say I think with confidence that if mermaids really did live in the sea they certainly did not have a pair of human kidneys. There are nevertheless marine mammals, and they must drink sea water and yet retain control of their water metabolism. I am not aware of any study having been made of the kidney function of these animals, but I imagine it would be relatively easy and be well repaid.

The marine fish, which you will remember live in a hypertonic medium but are unable to secrete a urine more concentrated than their blood, have solved the problem of their water regulation in two quite different ways.^{95 96} The bony fish drink sea water, which is absorbed, and excrete through their gills⁴⁶ a solution of sodium chloride more concentrated even than the sea. The result of this is to leave enough free water in the tissue fluids to enable the animal to elaborate the hypotonic and almost chloride-free⁶¹ urine. Owing to the extrarenal excretion of salt and water the secretion of water by the kidneys of the marine teleosts is very small. Glomerular filtration is really unnecessary, and hence some of the more highly developed forms have lost all their glomeruli. The elasmobranchs, on the other hand, have perfected quite another mechanism, and it is to this which I wish particularly to draw your attention. These animals have gills which are impermeable to urea. Their glomerular function is quite normal. Soluble salts are readily excreted, and also xylose and inulin, which are not excreted by the aglomerular fish, but the urine contains only traces of urea in spite of concentrations of 1 per cent. and more in the plasma.

It has been shown¹⁴ that this is due to the active reabsorption of urea by the tubule cells so that ultimately the animal becomes hypertonic to sea water by virtue of the urea which it contains. Water therefore is absorbed from the sea by osmosis through the gills and possibly other parts, and this enables a hypotonic urine to be secreted. Here then we have an example of the active reabsorption of an end-product of nitrogen metabolism, and interest lies in the process because it can be shown by any of the methods of measuring glomerular filtration that something of the same sort goes on in many other animals, including man. It may seem strange to you, but I think we must accept it, that a large part of the urea filtered off in our glomeruli either diffuses back into the blood stream or is more probably actively reabsorbed. I shall have more to say on this subject in a subsequent lecture.

WATER REGULATION IN MAN

Clothes moths and snakes can exist for long periods of time on their own water of metabolism,⁷⁸ but most animals and man must have a regular supply of water. In its absence urea accumulates in the blood but the nitrogen balances become negative so that a generalised tissue disintegration must set in. Death soon follows. The urine volumes are well maintained until the end, partly no doubt by the water set free from the cell breakdown, but the cause is not at all clear.^{55 98}

Too much water is just as fatal as too little.⁹⁷ Animals may readily be killed by pushing the administration of water. At first a diuresis develops, but later and most unexpectedly the animals get an oliguria, and finally an anuria. Towards the end they get convulsions from cerebral oedema.¹⁷ Patients have been killed in the same way.³⁴

Everyone recognises that if water is taken by mouth the usual consequence is the passage of additional dilute urine and the restoration of the *status quo*.¹ This apparently simple function is in reality a complicated one.^{2 60 100} The water absorbed lowers the osmotic pressure of the plasma, but the diuresis does not coincide in point of time³ so that one cannot postulate a simple renal mechanism regulating the osmotic pressure of the plasma. Moreover, if the plasma osmotic pressure be reduced in other ways, no diuresis is produced, and water then brings about less diuresis than before.³

The regulation of water metabolism in man is a difficult study because of many,⁶⁰ but in particular I think because of two, complicating factors. In the first place the excretion of water has in the course of evolution come under the control of a hormone from the posterior pituitary,¹⁰ and the simple and well-known relationship between drinking and diuresis only holds so long as the supply of hormone to the circulation is normal.¹⁰⁰ In the second place, owing to the constancy with which mammals maintain their osmotic pressure, water metabolism and salt metabolism are intimately connected. Movement of water about the body is almost invariably accompanied by simultaneous movement of salts. The converse is also true. Thus the excretion of sodium salts brings about a reduction of the extracellular fluid volume, and a loss or gain of cell substance a corresponding change in potassium.²⁶ One of the most interesting recent developments in mineral metabolism is the discovery that the renal threshold for sodium seems to be controlled by the suprarenal cortex. At all events, in its absence and in Addison's disease forced excretion of sodium takes place with consequent changes in the water

balance of the body. I hope to discuss this more fully in my later lectures.

Let me close meantime by drawing your attention to an aspect of mineral metabolism and comparative physiology which I am sure will repay investigation. I refer to the control of so many aspects of mineral metabolism by the ductless glands, or by vitamins. The parathyroids, the thyroid, the suprarenal cortex, the posterior pituitary and vitamin D are all directly concerned with the water or mineral metabolism of the higher animals. Some would include vitamin A, but I prefer to regard the concretions produced by its absence³⁷ as being secondary to the changes in the urinary epithelium or pH.

When were these factors controlling calcium, phosphorus, water and sodium metabolism evolved? And what of potassium, magnesium, and iron? So far no controlling hormone for these elements has been discovered, but this is no proof that such a hormone does not exist.

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NEW HOSPITAL IN PONTEFRACCT.—By the will of Mr. W. H. Hydes either a maternity or a children's hospital is to be erected in the poor part of Pontefract. It is to be known as the Hydes Hospital and will be administered by the governing body of the General Infirmary. The sum bequeathed by Mr. Hydes is said to be about £65,000.

THE VIRUS ÆTIOLOGY OF ONE FORM OF LYMPHOCYTTIC MENINGITIS

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FROM time to time cases of meningitis of unknown ætiology have been described under a variety of names as serous meningitis, acute aseptic meningitis, or acute benign lymphocytic meningitis. The essential characteristics of the disease, first clearly described by Wallgren (1925), have been recognised in this country, on the continent of Europe, and in America; despite the view of workers such as Eckstein, Hottinger, and Schleussing (1932) who believe that lymphocytic choriomeningitis is an abortive form of either poliomyelitis or epidemic encephalitis there is general agreement that it is undoubtedly a disease sui generis.

Evidence as to the cause of the disease was first obtained by Armstrong and Lillie (1934) in America when, during the transmission in monkeys of infectious material from an individual who had died at St. Louis during the 1933 epidemic of encephalitis, they encountered a previously unidentified virus which in rhesus monkeys caused round-celled infiltration of the meninges and choroid plexus. The pathological condition was, therefore, designated lymphocytic choriomeningitis, the virus being quite distinct from that isolated by Muckenfuss, Armstrong, and McCordock (1933) and Webster and Fite (1933) and shown to be the undoubted cause of St. Louis encephalitis. Later Armstrong and Wooley (1935) isolated two other strains of a virus, pathologically, immunologically, and clinically identical with the first: one of these strains was obtained from a female who died in Maine, the other from a monkey that died after inoculation with the virus of poliomyelitis (monkey strain). These three strains were found to be pathogenic not only for rhesus monkeys but also for mice, though not infrequently individual mice were found to resist inoculation. In those mice that succumbed to the infection there was found, as in monkeys, infiltration of the meninges and choroid plexus with lymphocytes. Armstrong and Wooley (1935) and Armstrong and Dickens (1935) also showed that the sera of persons who had suffered from "aseptic meningitis" in districts as far apart as California, Maryland, District of Columbia, Illinois, Ohio, and Virginia contained immune bodies to the virus of lymphocytic choriomeningitis. At the same time Rivers and Scott (1935) isolated an identical virus from the cerebro-spinal fluid of two laboratory workers, while Traub (1935) isolated the same virus from a strain of apparently normal mice used in laboratory work at Princeton, New Jersey.

There is thus evidence that the virus of lymphocytic choriomeningitis is widely distributed in the United States of America.

The probability that the same or a very closely allied virus was present in this country first arose in the autumn of 1934 when, through the kindness of Dr. J. A. Murray, F.R.S., at the time director of the Imperial Cancer Research Laboratories, one of us (G. M. F.) received a mouse that had exhibited

nervous phenomena. This mouse, which had been the bearer of an engrafted tumour, had been exposed to radium. It was thought that either the radium, by damaging the central nervous system, was itself responsible for the symptoms, or as the result of a local injury some infectious agent had gained access to the brain. The latter view proved to be correct, for mice inoculated intracerebrally with brain emulsion from the first mouse died in 6-8 days with definite nervous symptoms. Cultures made from the brains of these mice were bacteriologically sterile, but filtrates obtained after passage through Berkefeld V candles proved to be pathogenic for mice. Seven passages were made in mouse brains with this virus (M strain) which was found to be pathogenic not only for mice but for rhesus monkeys, rats, and guinea-pigs. It thus seemed probable that the virus isolated by Armstrong and Lillie (1934) was also present in this country. In order that this point might be investigated, Dr. Charles Armstrong of the United States Public Health Service, to whom our thanks are due, very kindly supplied us with a strain of his virus.

Before further investigations were made, however, it appeared to be essential to make certain that the virus was not already present in a latent form either in mice or monkeys in use in the laboratory. With this end in view, the sera of 22 rhesus monkeys were tested for immune bodies to the Armstrong strain of lymphocytic choriomeningitis virus [the A strain]. In none were immune bodies found.

ISOLATION OF LYMPHOCYTIC CHORIOMENINGITIS VIRUS FROM MICE

Three strains of laboratory mice were tested for their reaction to the A strain of the virus. Twelve mice were selected from each strain. Six of these mice were inoculated intracerebrally with 0.03 c.cm. of a 2 per cent. suspension of starch in physiological saline, the other six were inoculated intracerebrally with 0.03 c.cm. of a 10 per cent. suspension in saline of mouse brain infected with the A strain. All three strains of laboratory mice were found to be free from infection, for of the mice infected with the A strain all died with typical symptoms, while all those inoculated with starch remained in good health for the four weeks during which they were kept under observation.

At the same time it appeared to be of interest to determine whether other breeders' mice were infected with lymphocytic choriomeningitis virus. Mice from fifteen breeders were therefore tested as before. All proved non-resistant except one strain. Here, of 12 mice inoculated intracerebrally with the A strain of the virus 5 were completely resistant, while of 12 injected intracerebrally with starch 4 developed symptoms in 6-11 days. Brain emulsions from these mice were inoculated intracerebrally into fresh mice which all died in 6-8 days. Eleven passages have been made with this virus of mouse origin (N strain).

The symptoms produced in mice by the A, M, and N strains are identical. The mice after intracerebral inoculation with a 20 per cent. suspension in saline of infected brain invariably die in 6-8 days. Shortly before death they develop a staring coat and tend to sit quietly in a corner of their cage; sometimes a slight tremor develops; if touched or stimulated in any way at this period they exhibit a form of convulsion, becoming quite rigid with the hind legs extended; in a few seconds breathing stops and the mice are dead, though the limbs still remain stiffly extended after death.

When inoculated intracerebrally the minimum lethal dose is usually 0.03 c.cm. of a mouse brain suspension diluted 10^{-5} or 10^{-6} . At death virus is present not only in the brain but in the blood, kidneys, liver, spleen, adrenal, and lungs. It is also present in the urine, as noted by Traub (1935). When the virus is inoculated intraperitoneally the mice as a rule show no symptoms, though occasionally after a large injection—0.3 c.cm. of a 20 per cent. suspension of mouse brain—death has occurred with the usual cerebral symptoms. After intraperitoneal inoculation virus has been recovered from the spleen and occasionally from the kidney 2½ months later. Virus applied to the lightly scarified skin of the mouse's abdomen may later be obtained from the kidneys and spleen. Virus was also obtained from the same organs of 2 out of 10 mice that had been fed on infected mouse brain ten days previously. Although virus may have been absorbed through the lining of the alimentary canal the possibility in these cases of entry through small wounds on the limbs or about the mouth cannot be excluded. Instillation of the virus into the nostrils of mice under light ether anaesthesia is followed by the development of cerebral symptoms and death.

Mice dying from the disease rarely show any naked-eye pathological lesions. On a few occasions bronchopneumonic patches were present in the lungs; more commonly the liver was pale yellow and fatty or old rose instead of purplish-red in colour.

ISOLATION OF VIRUS FROM HUMAN CASES OF LYMPHOCYTIC MENINGITIS

Preliminary experiment having shown that the stock animals to be used in the investigations were free from infection with the virus of lymphocytic choriomeningitis, an attempt was made to isolate the virus from the cerebro-spinal fluid of patients suffering from meningitis of unknown aetiology. Up to the present it has been possible to isolate the virus from two individuals A. W. and B. C. The clinical histories of these patients are as follows.

THE CASE OF A. W.

This patient, a man aged 46, was admitted to the National Hospital on Oct. 17th, 1935, under the care of Dr. J. Purdon Martin. His family history was negative, and there was nothing of note in his personal history except that some days before the onset of his illness he had cleared out a shed which was heavily overrun with mice.

About five weeks before admission he developed a headache, pain in the back, and a temperature of 102° F., which he attributed to "influenza." These symptoms persisted, and as no cause could be found for the pyrexia he was admitted to the North Western Fever Hospital as a typhoid suspect. No evidence of enteric fever was obtained however during the nineteen days he remained in this hospital. Whilst there he ran an intermittent temperature which rose nightly to 101° F., though it gradually settled towards the end of his stay. On Oct. 5th he became rather confused and slightly hallucinated, and a day or two later pain and tenderness developed over the legs and lower abdomen. On Oct. 11th he found difficulty in drawing up the left leg, and on the following day both legs became completely paralysed. At this time he lost all sensation in his bladder.

Clinical and laboratory findings.—When admitted to the National Hospital on Oct. 17th the patient was obviously confused, though correctly orientated, could not give a connected history, and occasionally used wrong words. The cranial nerves were normal apart from early bilateral papilloedema. The movements of the arms were normal. He was not able to sit up and the only movements possible in the legs were contraction of the right

quadriceps and weak movements of the right ankle and toes. Reflexes: arms-jerks, + a - ; knee- and ankle-jerks, + a - ; abdominal reflexes absent; plantars extensor. Sensation: from the umbilicus down to the level of the fourth lumbar segment there was a marked hyperalgesia with overreaction. Below this level all forms of sensation were impaired. The calf muscles were very tender to pressure. There was complete retention of urine.

The cerebro-spinal fluid, examined on Oct. 18th, was clear and colourless; the pressure was 195 mm. Cells: 138 per c.mm., 98 per cent. lymphocytes, 2 per cent. large mononuclears. Protein: 0.28 per cent. Nonne-Apelt and Pandy reactions positive +. Lange 0112232222. Wassermann reaction negative in blood and cerebro-spinal fluid. The changes in the C.S.F. are set out in the accompanying Table.

Table showing Changes in C.S.F.

	Oct.						Nov.	
	18th	19th	21st	23rd	25th	31st	7th	16th
Pressure (mm.)	195	120	—	—	—	—	—	—
Cells (per c.mm.)	138	182	330	272	168	34	30	9
Lymphocytes (per cent.)	98	100	97	96	—	100	100	100
Large mononuclears (per cent.)	2	0	—	0	—	0	0	0
Polymorphs. (per cent.)	0	0	—	4	—	0	0	0
Protein (per cent.)	0.28	0.15	0.15	0.12	0.09	0.14	0.08	0.10

A blood count on Nov. 27th showed 37,200 white blood-cells per c.mm. (polymorphonuclears, 76.5 per cent.; lymphocytes, 23.5 per cent.).

Progress.—Power gradually returned to the legs and he can now just lift his right ankle off the bed but cannot move the left leg. Tone has increased and ankle-clonus can be elicited on both sides. The plantar responses are extensor. He is unable to sit up without support and he cannot stand. Sensation: the overreaction gradually passed off and by Nov. 26th had disappeared. The analgesia grew steadily less and the only abnormality of sensation now present is some loss of deep sensibility and of bladder sensation. He began to pass urine naturally on Nov. 22nd.*

CASE OF B. C.

Aged 36, this patient was admitted to the National Hospital on Nov. 6th, 1935, under the care of Dr. Gordon Holmes. His personal history and his family history were negative.

Twenty days before admission he developed a slight cold in the head accompanied by sneezing and malaise. Two days later his voice almost disappeared and he had two or three rigors. The following day he felt better and he remained well for four days. On Oct. 24th he felt ill again and complained of an aching pain in the back and insomnia. This pain gradually became more severe and spread up to between the shoulder-blades. A week before admission it decreased in severity but he noticed a tingling in his finger-tips and weakness in his grip. He also found he could not taste normally and his teeth "felt too big." In addition he had slight difficulty in passing urine. By the next day numbness and tingling of the feet developed and his legs became weak. This weakness increased rapidly until he was unable to walk without support. The day before admission there was weakness of the facial muscles on the right side and momentary diplopia occurred.

On admission his temperature was 100° F. He complained of retention of urine. Cranial nerves: There was a slight ptosis on the left side and a facial palsy of lower motor neurone type on the right side. Otherwise the cranial nerves were normal. The movements of both arms were weak, especially at the shoulders. He was unable to sit up in bed. The movements of both legs were so weak that he was unable to stand. Reflexes: All

* Since this was written progress has continued and he is now able to walk.

tendon-jerks were absent. Abdominal reflexes, upper present, lower only faintly present. Plantar responses, both extensor. Sensation: There was a loss of all forms of sensation peripherally in the arms; some impairment below the level of the third dorsal segment, but greater peripherally in the legs. The soles of the feet were tender. Cerebro-spinal fluid (Nov. 6th): pressure, 140 mm.; slightly yellow; fine coagulum formed on standing. Cells: 63 per c.mm., 12 per cent. large mononuclears. Protein: 0.275 per cent. Nonne-Apelt positive +; Pandy positive ++. Lange 0000111122. Wassermann reaction negative in C.S.F. and blood. Blood count (Nov. 6th): white blood-cells, 8200 per c.mm. Nov. 27th: white blood-cells, 11,400 per c.mm. (polymorphonuclears 71 per cent., lymphocytes 29 per cent.).

Progress.—Catheterisation was necessary for three or four days. On Nov. 11th he developed a complete left facial paralysis. Motor power gradually returned and by the 29th he was able to walk, the arms being then almost normal, though the right facial palsy was still present. Sensation had also returned by this time, though the tendon-jerks were still absent and the plantar responses remained extensor. On discharge he had regained practically full use of his limbs, but still had an almost complete paralysis of his right facial muscles, which gave a complete reaction of degeneration.

Cerebro-spinal fluid was removed from A. W. on the 37th day of illness. A rhesus monkey was inoculated intracerebrally with 1 c.cm. while 12 mice were each inoculated intracerebrally with 0.03 c.cm. Of these mice four died 7, 10, 10, and 16 days later; histological examination of their brains revealed round-celled infiltration of the choroid plexus and meninges. The monkey remained normal for 8 days after inoculation; its temperature then rose to 104° F. and continued between 104° and 106° F. till it was killed on the 13th day after inoculation. During the whole of this time it exhibited no definite nervous symptoms but lost weight and was abnormally quiet. No naked-eye lesions were found at the post-mortem and no bacteriological growth was obtained in aerobic and anaerobic cultures made from the blood and brain. Blood-serum, brain, and liver tissue were inoculated intracerebrally into mice which died in 6-8 days with symptoms typical of lymphocytic choriomeningitis, while characteristic lesions were found in the central nervous system.

Virus obtained from the blood-serum of this monkey has been carried on for 18 passages in the brains of mice and has shown no diminution in virulence during these passages, the mice invariably dying 6-8 days after inoculation. Two rhesus monkeys were each inoculated intracerebrally with 1 c.cm. of a 20 per cent. suspension in saline of the brain of Monkey 1. Five and nine days later their temperatures rose above 104° F. Monkey 2 gradually lost weight and continued with a febrile temperature till the 10th day after inoculation. Its temperature then fell and it became weak in the hind legs, slight ptosis developed in both eyelids, and the monkey was killed moribund 14 days after inoculation. Monkey 3 ran a similar course and was killed 18 days after inoculation. 1 c.cm. of blood-serum from Monkey 1 was inoculated intracerebrally into Monkey 4. This animal showed a rise of temperature to 105° F. 4 days after inoculation and was killed 10 days after inoculation with symptoms identical with those of Monkeys 2 and 3. At death in all cases there were no characteristic appearances, though in Monkey 2 the liver was rather pale. Bacteriological cultures from the blood and brain were again sterile, but mice inoculated intracerebrally with liver, blood, brain, and adrenal all died in 6-8 days.

The symptoms produced by this (W) virus and its

distribution in these monkeys are identical with those obtained with the American strain of the virus of lymphocytic choriomeningitis.

Cerebro-spinal fluid obtained from A. W. on the 44th day of his illness, seven days after the first withdrawal, was also inoculated intracerebrally into mice and into a rhesus monkey but the results were entirely negative.

Cerebro-spinal fluid was obtained from B. C. on the 15th day of his illness. Twelve mice were inoculated intracerebrally with 0.03 c.cm. but only two died during the night 14 days later. The brains of these mice however showed histological changes typical of lymphocytic choriomeningitis.

A rhesus monkey (No. 5) inoculated intracerebrally with 1 c.cm. of cerebro-spinal fluid showed no symptoms till 14 days after inoculation when its temperature rose to 104° F. Till the 23rd day after inoculation a febrile reaction continued, then the fever gradually abated and the animal recovered. Blood-serum from the monkey inoculated intracerebrally into mice on the 17th and 25th days after inoculation contained virus, since the mice died in 6-8 days. The blood of the monkey was bacteriologically sterile. Blood-serum obtained from the same monkey 37 days after inoculation and inoculated intracerebrally into mice did not contain virus.

The virus obtained from the blood of this monkey has been carried on in the brains of mice for 13 passages. Both the W and C strains of virus were found to be pathogenic for guinea-pigs and rats. Guinea-pigs inoculated intracerebrally died in 9-22 days. The only symptoms due to the virus were gradual loss of weight, emaciation, and great muscular weakness. Rats died in 8-11 days with similar symptoms. Identical symptoms were produced in these species by intracerebral inoculation of the American strain of the lymphocytic choriomeningitis virus.

In addition to the rhesus monkey the crab-eating macaque *Macaca irus* has been found to be highly susceptible to intracerebral inoculation with both the English and American strains of the choriomeningitis virus. The following species do not exhibit any clinical symptoms following intracerebral injection of the virus: dog, ferret, hedgehog, field vole (*Microtus agrestis*), bank vole (*Evotomys glareolus*), rabbit, hen, canary, and parakeet. Wild mice are also susceptible to intracerebral inoculation; sufficient experiments have not yet been made to determine whether they may harbour the virus under natural conditions. Immune bodies may develop after inoculation, and the rabbit has been used for the production of immune sera. The virus may persist in the brain of the rabbit for at least 7 days.

HISTOLOGICAL LESIONS

The essential histological lesion in the nervous system was that of an acute leptomeningitis, particularly incident upon, though not confined to, the basal meninges, which produced an intense cellular exudation throughout the entire ventricular system. The lesions were similar in all the animals examined; they differed only in severity. Separate descriptions of the appearances seen in the various species would be redundant. The following description of the lesions in the nervous system of a guinea-pig inoculated intracerebrally with the English strain of virus (W) will suffice as an example:—

The meninges at the base of the brain were heavily infiltrated with cells. The infiltration extended over the cerebellum and for some distance over the posterior surface of the spinal cord, but did not extend over the vertex of the brain. The predominating type of cell

present was the small lymphocyte, though many polymorphonuclears and plasma cells were also seen. In some areas in the fourth ventricle a perivascular arrangement of cells was noted, and in that part of the medulla adjacent to the floor of the fourth ventricle there was engorgement of the smaller blood-vessels and slight perivascular infiltration. In sections of the brain which contained portions of choroid plexus there was an intense exudation of cells in between the choroidal cells, though these did not appear to be damaged by the infiltration. In general it may be said that the cells of the choroidal plexus were somewhat hypertrophied.

The iter of Sylvius contained many cells, whilst the cavities of the lateral ventricles were almost obliterated by cellular masses.

The brain tissue was little affected by these meningeal lesions. The only reaction of note was a proliferation of the marginal neuroglia in the tissue adjacent to the walls of the lateral ventricles. There was no microglial reaction; no changes in the neurones could be detected and there was no evidence of demyelination.

As regards the severity of the lesions in the different animals, these were most intense in mice and guinea-pigs inoculated intracerebrally with either the American or W strain of virus. In monkeys the lesions were much less striking. In Monkey 2, inoculated with W strain, the basal meninges only were affected, and these not to any great extent, but in the brain of a mouse inoculated with blood from this monkey the ventricular lesions were especially severe, the cells of the choroid plexus in the lateral ventricles being stuck together by masses of infiltrating cells, whilst there was much cellular infiltration of the meninges over the posterior aspect of the spinal cord.

No lesions could be found in the brain of a ferret inoculated with the W strain of virus. In rabbits there were a very small number of infiltrating cells in the meninges and choroid.

In only three mice have intranuclear inclusions been found resembling those described by Traub (1935) in guinea-pigs. These inclusions were found more especially in the cells of the choroid plexus and resembled in many respects those produced by the guinea-pig salivary virus. It seems extremely doubtful whether they are caused by the virus of benign lymphocytic choriomeningitis, since on rare occasions they have been found in the brains of apparently normal mice. The true significance of these acidophilic inclusions has recently been demonstrated by Thompson (1936). They are due to a virus found in the salivary glands of mice. On the other hand, as will be mentioned later, small granules are found in the cytoplasm of many mononuclear cells in the exudate.

In mice lesions are as a rule restricted to the central nervous system, though occasionally in the lungs there is evidence of a virus pneumonia while in the liver the Kupffer cells are swollen and prominent. In guinea-pigs and monkeys, more especially *Macaca irus*, the liver often exhibits fatty degeneration with areas of focal necrosis, accompanied by round-celled infiltration. Focal areas of round-celled infiltration are also seen in the suprarenals of monkeys, particularly in the cortex. In the kidneys the glomerular tufts are swollen as a result not so much of infiltration with round cells as of undue prominence of the endothelial cells; occasionally a few infiltrating cells are found between the convoluted tubules.

IMMUNOLOGICAL REACTIONS

Sera from A. W. and B. C. were found to contain virucidal antibodies not only against the homologous strains but against each other, the American strain and the N strain derived from English mice. Antisera were prepared in the rabbit against the American

and N strains. These sera were found to neutralise from 100 to 1000 M.L.D. (minimum lethal doses) of virus, whether of the homologous or heterologous strains. The monkey which recovered after inoculation with the cerebro-spinal fluid of B. C. was subsequently resistant to intracerebral inoculation with the American strain. The human strains isolated in this country are thus either identical or at any rate very closely related both to the American human strain and to the English mouse strain. A number of other human sera have also been examined during the course of these experiments. The results will be given in a further publication but a few details may not be without interest. The brother of A. W., for instance, who lived with him gave no protection, but his partner in the garage where he worked had immune bodies in his serum, although without a history of illness affecting the nervous system. The serum of a patient from Ireland whose history has recently been detailed by Collis (1935) protected both against American and English strains. This patient lived in an eighteenth century house overrun with rats and mice. Our thanks are due to Dr. W. R. F. Collis of Dublin for supplying this serum.

Serum from one of us (G. M. F.), who has carried out the animal experiments here described, fails to protect.

THE VIRUS

Filtration experiments with both the American and English strains show that the virus suspended in Hartley's broth passes through Berkefeld V filters, Chamberland L₁ and L₂ candles, and with difficulty through Seitz E or K discs or Berkefeld N filters. This finding would indicate that the virus is of comparatively large size. This is also borne out by the fact that by centrifugation for 3 hours at 10,000 revs. per min. it is possible to concentrate a considerable part of the virus in the deposit. Finally in experiments carried out in conjunction with Dr. R. D. Mackenzie it has been possible to demonstrate, in the cytoplasm of mononuclear cells from the brains of mice, rats, and monkeys infected with all strains of the virus, minute granules which stain purplish red with Giemsa, and are approximately of the same dimensions as the virus of herpes. These granules may be the actual virus. Agglutination and other experiments are at present being undertaken to investigate this question. The virus kept at 4° C. retains its activity for at least 10 days and at 22° C. for at least 6 days, although by this time a considerable part of the virus is destroyed.

DISCUSSION

The experiments here described show that from apparently healthy mice it is possible to obtain a virus which on intracerebral inoculation into monkeys, mice, guinea-pigs, and rats gives rise to a fatal infection associated with infiltration of the meninges and choroid plexus. The involvement of the central nervous system appears however to be only part of a more generalised infection, since the virus circulates freely in the blood stream. From the cerebro-spinal fluids of two patients with somewhat vague nervous symptoms following febrile reactions it has been possible to obtain a virus which in experimental animals behaves in the same way as that obtained from English mice. The three English strains also behave in the same way as a strain isolated by Armstrong from a case of benign lymphocytic meningitis in America. Serum from a patient in Ireland recovered from the same disease contains immune bodies to both the American and English strains of the virus. There is thus evidence that

this virus infection is widely spread on both sides of the Atlantic. The virus is excreted in the urine of mice and can pass with ease through the scarified skin, which may thus constitute the chief portal of entry in human cases though the virus may possibly enter also through the nasopharynx. The evidence here brought forward shows that a virus infection is present in mice and possibly also in rats and that this virus can be communicated to man. The exact portal of entry in human cases has not yet been determined but judging from analogies with infection by *Leptospira icterohæmorrhagæ* it is likely to be the skin or mucous membranes.

SUMMARY

1. A virus has been isolated from the cerebro-spinal fluid of two patients suffering from obscure nervous symptoms associated with an increase of lymphocytes in the cerebro-spinal fluid.

2. The virus inoculated intracerebrally into monkeys, mice, rats, and guinea-pigs causes a fatal infection; post mortem there is intense infiltration of the meninges, choroid plexus, and ventricles with round cells.

3. When inoculated intraperitoneally into mice the virus causes no symptoms but remains for some weeks in the spleen and kidneys. It is excreted in the urine of mice and can pass through the lightly scarified skin.

4. A similar virus has been isolated from apparently healthy mice.

5. The human and mouse strains isolated in this country behave in animals in the same way as the American virus described by Armstrong.

6. Sera from human cases in this country contain immune bodies to the American virus and to the English mouse strain virus.

7. Certain of the properties of the virus are described and the mode of infection discussed.

Our thanks are due to Dr. Charles Armstrong, of the United States Public Health Service, for his kindness in supplying us with a strain of the virus isolated by him. We also desire to thank Dr. Purdon Martin and Dr. Gordon Holmes for permission to investigate and to publish details of the patients under their care, and Dr. D. F. Rambaut for allowing the investigation of pathological material to be carried out in the laboratory of St. Andrew's Hospital, Northampton.

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IDIOPATHIC DILATATION OF STENSON'S DUCT

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DILATATION of Stenson's duct in the absence of obstruction or infection is an unusual condition. In the former group of cases the obstruction is invariably due to a calculus, and in the latter the dilatation is associated with recurrent pyogenic parotitis. The case now reported differs from both of the foregoing types in being associated with neither obstruction nor infection; and in the absence of exact knowledge as to the underlying pathology it can only be regarded as possibly due to achalasia of the duct orifice.

CASE RECORD

The patient, a surgeon aged 51, first came under my care in May, 1934, on account of recurrent swelling and dilatation of the masseteric and buccal portions of the right parotid duct. These symptoms had started some two years previously and on the first occasion developed while the patient was operating. Since then he had never been free from the trouble. The swelling of the duct often occurred in the earlier part of the day, at times developing whilst the patient was drinking a cup of tea. On the whole the symptoms were particularly prone to develop during work demanding concentrated effort such as operating or putting up a fracture. The attacks had at times been induced by pipe-smoking and occasionally by emotional stress. When the swelling developed it could be felt as a small oval tumour in the line of the right parotid duct, and it was accompanied by discomfort rather than actual pain. The patient had learnt to relieve his symptoms by pressure over the swelling which immediately led to its disappearance and was followed by a gush of saliva into the mouth. On operating days this manœuvre was carried out between operations in order to keep free from discomfort. At no time had there been any swelling of the parotid gland itself and there were no symptoms referable to the other salivary glands.

Past history.—The patient had had a hæmoptysis at the age of 21, and on this account went to live abroad. Shortly after this he had a mild attack of uncomplicated typhoid fever. He had never suffered from mumps or any other disease of the salivary glands. There was no history of hay-fever, asthma, eczema, or other allergic manifestation. In 1931 he had new dental plates which never fitted very accurately, and the swelling of the right parotid duct started a year after this. His general health had been good but he was very highly strung and for some years had persistently overworked.

PHYSICAL SIGNS

The patient was a healthy, active man of sparse build. On examination of the right cheek when the swelling had developed a diffuse fullness could be seen in the line of the parotid duct in its masseteric and buccal portions. On palpation the parotid gland was not enlarged or tender but the distended duct could be felt as an ovoid tumour $1\frac{1}{2}$ in. long and $\frac{1}{2}$ in. wide at its widest part, reaching from the hilum of the gland to the duct orifice. The distended duct was slightly tender and pressure over it gave rise to a gush of saliva into the mouth. There was no abnormality to be made out after the duct had been emptied in this way. The orifice of the duct in the mouth was natural, there was no evidence of any local scarring, and the surrounding mucosa was normal. Its appearance was in every way identical with the orifice of the left parotid duct. The other salivary glands, their ducts, and the duct orifices all appeared natural. The patient was edentulous and the condition of the buccal mucosa was healthy.

Saliva.—A catheter specimen of saliva from the right parotid duct was profuse, clear, and free from mucus, and its diastatic content was 20,000 units. A Gram film showed an occasional epithelial cell of pavement type in some of the fields but no organisms were present and cultures were sterile.

Skiagrams and sialograms.—Skiagrams showed no evidence of a parotid calculus. Sialography was carried out and the resulting pictures are shown in Figs. 1 and 2.

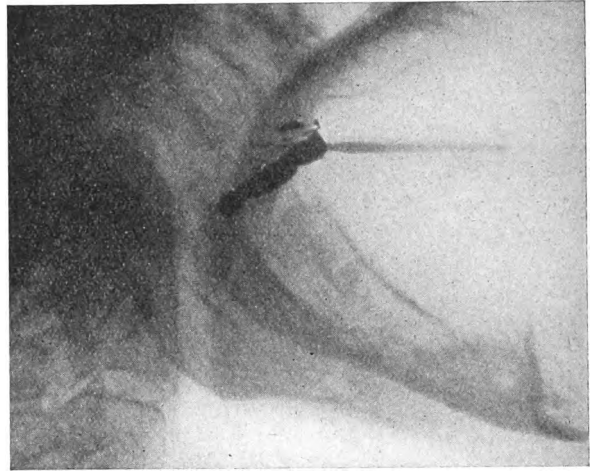


FIG. 1.—Right sialogram showing a marked degree of dilatation of the buccal portion of the parotid duct.

Fig. 1 shows much dilatation of the buccal portion of the duct and Fig. 2 shows this condition together with dilatation and segmentation of the masseteric portion of the duct. Several attempts were made to get the lipiodol to pass into the intraglandular ducts, but without success. This was presumably due to some valve action in the interior, the mechanism of which was also responsible for the absence clinically of involvement of the intraglandular ducts in the swelling.

OPERATION

Under general anaesthesia the terminal $\frac{1}{4}$ in. of the duct was excised together with $\frac{3}{4}$ in. of its inner wall. The resulting cavity was packed with gauze. Irrigation followed by dilatation with small sinus forceps was carried out twice daily after operation and the wound kept lightly packed with gauze. The patient's jaw was bandaged and the diet was restricted to fluids. Healing of the mucosa was completed in about eight days, after which dilatation was carried out with canaliculus probes, daily at first and then at increasing intervals for a period of six weeks. No swelling of the parotid gland occurred after operation and the patient has remained free from symptoms since then.

COMMENT

Recurrent swellings of the parotid gland may be due to a variety of causes, including calculi, infections, drugs, &c. Recently Pearson¹ has investigated these conditions in children and in the light of some of the evidence has suggested that there is a relationship between certain types and allergic manifestations such as eczema and hay-fever. The sudden appearance and disappearance of the parotid swellings in some cases and the occasional history of a familial tendency have led other workers to arrive at similar conclusions.

The case now recorded differs from those referred to above in that the parotid gland itself was never involved, the swelling being entirely confined to the duct. The condition was not associated with any known allergic phenomena, but tended especially to occur during concentrated effort or as the result of some emotional stress. Clinical investigation demonstrated the absence of infection of the saliva

and also showed the degree of dilatation of the duct. Jemtel² records a very similar case occurring in a boxer of 25. This patient developed a swelling of the parotid duct whenever he ate anything. Investigation showed a condition identical with that in the case now recorded, and a similar operation was performed with equally satisfactory results. A somewhat similar case in a man of 70 is recorded by

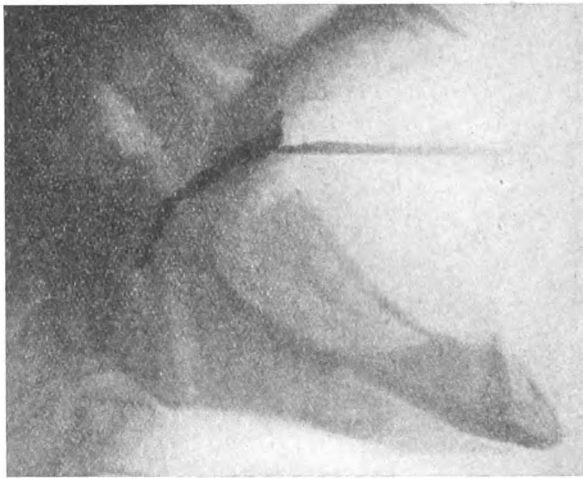


FIG. 2.—Right sialogram, after further injection of lipiodol, showing much dilatation of the buccal portion of the duct, together with dilatation and segmentation of the masseteric portion of the duct.

Bársony.³ In this case the swelling appeared during every meal and disappeared after massage, but the duct orifice was enlarged and the dilatation of the duct involved some of the intraglandular ducts.

The clinical evidence in the case now reported suggests that the pathological dilatation of the parotid duct was secondary to the failure of relaxation of the duct orifice. The conditions under which the swelling occurred suggest that some neuromuscular incoördination in a gland under the control of the parasympathetic system was a causal factor. If this is the case the condition bears some resemblance to achalasia of the cardia. In the present case recovery followed the operation described.

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PRIMARY INTRAHEPATIC CARCINOMA OF THE BILE-DUCTS

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AN unmarried woman, aged 46, a cook, was admitted to St. George's Hospital complaining of abdominal pain and vomiting of three weeks' duration.

She had had slight indigestion and vomiting for the previous three months. The pain was severe, constant, and was not relieved by taking food, but it was somewhat eased by flexing the trunk. One week before admission she had a slight hæmatemesis. She was constipated and sometimes passed bright red blood on defæcation. There were no abnormal urinary symptoms. She said that she had vomited bile occasionally and had had attacks of jaundice, which lasted only 24 hours. In two months she had lost a stone in weight. There was nothing of

importance in her past history or in her family history. She had travelled extensively in Egypt and Syria, but had contracted no diseases while abroad.

On admission to hospital on Nov. 23rd, 1935, the temperature was 97.5° F., pulse 105, and respirations 23 per min. She was pale and weak in appearance, but not wasted. The abdomen was distended, particularly in the upper half. She was very tender in the right hypochondrium. The liver extended downwards 3 in. below the costal margin and was tender; the gall-bladder was palpable below the liver. There were some recently inflamed external piles and the rectum contained soft fæces. The bases of the lungs were slightly dull to percussion; the heart was normal. A blood count showed: red cells, 5,160,000; hæmoglobin, 74 per cent.; leucocytes, 9920; colour-index, 0.64; polymorphs, 74 per cent.; lymphocytes, 20 per cent.; mononuclears, 8 per cent.; eosinophils, 5 per cent.; basophils, 1 per cent. The sedimentation-rate by Westergren's method was 24 units in the first hour. The Wassermann reaction was not quite negative. The diastase index of the urine was 200 units, or about 10 times the normal. Skiagrams taken on Nov. 26th showed a group of abnormal shadows in the gall-bladder region, possibly due to gall-stones. There was nothing abnormal shown in the lungs. An opaque meal was given on Nov. 28th, and skiagrams showed the gall-stone opacities and gastritis, but no other organic lesion; the gastric emptying time was normal and no lesion was detected in the large intestine. A further skiagram of the chest on Dec. 4th showed that the right diaphragm was much raised and there was a small right pleural effusion.

The patient became worse and progressive enlargement of the liver was observed. She was in constant pain. She died on Jan. 5th, 1936.

Autopsy showed that the abdomen contained 1½ pints of fluid. The liver was greatly enlarged and weighed 15 lb. and the diaphragm was pushed up on the right to the level of the third rib. There was a diffuse carcinomatosis of the liver, especially of the right lobe, with enlarged glands at the hilum and in the gastro-hepatic omentum. The gall-bladder contained one large stone and many small ones. There were no pathological changes of importance in the rest of the body, and no evidence of metastasis or other growth was found. Sections were cut of the liver and the glands taken from the gastro-hepatic omentum. The sections of the liver showed extensive infiltration of adenocarcinoma. The cells resembled those of the bile-ducts and were cylindrical in shape, tending to become ellipsoid in some parts of the sections; there was no evidence of cirrhosis. The sections of the glands showed infiltration with similar cells.

Multiple carcinoma of the intrahepatic bile-ducts is uncommon. It is estimated that primary carcinoma of the liver accounts for only 0.5 per cent. of all cancers, and different authorities consider that 14–32 per cent. of primary carcinomata of the liver arise from the bile-ducts.¹ Bile-duct carcinoma is associated with cirrhosis of the liver in 50 per cent. of the cases,² and is more common in women.³ There is jaundice in 60 per cent. and ascites in 58 per cent.

This patient, therefore, presented certain uncommon features. There was no evidence at autopsy of cirrhosis of the liver, though there were several clinical signs suggestive of it. While she was in hospital jaundice was absent but there was a history of very slight attacks some months previously. She was considerably younger than is usual in this disease.

I should like to express my thanks to Dr. A. Feiling for permission to publish this case, to Dr. John Taylor for the report of the autopsy, and to members of the radiological, bacteriological, and biochemical departments of St. George's Hospital for carrying out the various investigations in the case.

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FISTULA-IN-ANO *

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THE treatment of fistula-in-ano has a very ancient history. Reference to it can be found in all the earliest medical MSS. and what is probably the very first medical treatise on a special subject is a treatise on "Fistula-in-Ano," by John Arderne, which was found in a fifteenth century manuscript. Louis XIV., le Roi Soleil, was operated on for a fistula in 1687, and it was recorded his surgeon received the magnificent fee of £6000 for making a success of the operation.

THE CAUSES OF FISTULA

Foreign bodies.—It has been generally supposed until quite recently that most fistulæ arise as the result of injury from foreign bodies which have been swallowed. Undoubtedly a small percentage of fistulæ are so formed and there is a collection in the museum of St. Mark's Hospital of foreign bodies which have been removed from fistulæ. They consist mostly of haddock spines, rabbit bones, pieces of wood and metal, and seeds. But I think it is very doubtful whether more than a very small proportion of fistula are so caused.

Fissures and ulcers of all kinds in the anal region may result in fistulæ and abscess. A small neglected fissure is liable at any time to penetrate the muscular wall of the rectum, when a small direct fistula will generally result in an internal opening at the base of the fissure.

Suppuration of the anal glands is probably the most common cause of all fistulæ. These anal glands, until quite recently, appear to have been overlooked by anatomists. They occur near the lower part of the anal canal as tubular, branching structures, lined with transitional epithelium. They pass into, or through, the muscular coat of the bowel and end in the connective tissue. In some cases they can be seen to pass through the circular muscle coat of the internal sphincter and terminate in the ischio-rectal fossa. Very careful microscopic sections, cut in series, of the anal region generally demonstrate the presence of several such glands. Their composition and numbers are erratic, and they seem to serve no particular purpose. They correspond to the odoriferous glands in animals which act as a sex attraction to the male. They are very well marked in the rabbit, pig, and chicken. The ducts of these glands open into the bases of the crypts of Morgagni. Connecting as they do with the bowel lumen, these vestigial glands act as a path for infective organisms to reach the connective tissue and set up an abscess.

Dr. C. E. Dukes was able to actually demonstrate in 1931 that a case of fistula in St. Mark's Hospital was due to suppuration in one of these glands. Careful dissection of the fistula revealed that the track was lined with the transitional type of epithelium of which the glands are composed. This case was published by Sir Charles Gordon-Watson.¹ These findings have since been confirmed by other observers, notably by Dr. Tucker and Dr. Hellwig.²

Just as appendicitis is due to inflammation occurring in a vestigial organ, the appendix vermiformis, so fistula-in-ano is caused by a suppuration occurring in these vestigial sex glands.

Congenital cysts, as a cause of fistulæ, are much commoner than is generally supposed, and at St. Mark's Hospital quite a number of them are seen in the course of a year; even as many as two cases have been operated upon in one week. These cysts are an exaggeration of the post-anal dimple, which is found in some 20 per cent. of human beings. Patients are, of course, born with these cysts, but they seldom give trouble until adult life, when, possibly as the result of their rapid growth or of injury, they start to suppurate and an abscess forms. They may be detected easily, as they always occur in exactly the same place, just over the tip of the coccyx in the middle line. A very careful examination will generally reveal hairs projecting from the opening of the sinus, and when these hairs are seen it is quite conclusive.

These cysts have had a bad reputation in the past because their true nature has not been recognised and they will not heal up until they are completely cut out. As the tracks are lined with epithelium the cysts will reform unless every part of the cyst wall is removed. When completely cut out they, of course, give no further trouble. Sir John Bland-Sutton was the first person to recognise their true significance. They are due to faulty coalescence of the skin during early embryonic life and are true sequestration dermoids. They have no connexion whatever with the rectum.

Tubercle is the cause of fistula in about 20 per cent. of all cases. Tuberculous fistulæ can be fairly easily distinguished from ordinary fistulæ by their clinical appearances. There is very little induration of the tissues, the skin is undermined and of a blue or purplish colour, and the discharge is a thin serous one rather than ordinary pus.

The vast majority of cases of tuberculous fistulæ are secondary to phthisis of the lung, and the infection has no doubt reached the rectum as the result of sputum being swallowed. In a few cases tuberculous fistulæ may be primary, and in such instances the infection has probably come from the gut, as we know that tubercle bacilli are not infrequently to be found present in the fæces of people who have not got any clinical signs of tuberculosis. It is quite useless to test the pus from a fistula for tubercle bacilli, as it is seldom found even in cases where there is no question about the diagnosis.

There are two methods of proving the presence of tubercle in these fistulæ. One is to make a very careful microscopical examination of a piece of the wall of one of the tracks, the slides being stained by the Ziehl-Neelsen method and searched for tubercle bacilli; the other method is to inoculate guinea-pigs.

A portion of the wall of the fistula is cut up in small pieces and treated with antiformin. This destroys all the other micro-organisms but leaves the tubercle bacilli intact. After three hours the material is washed with a sterile salt solution, centrifuged, and the residue injected into the abdominal wall of the guinea-pig. At the end of six weeks the guinea-pig is killed and examined for caseous nodules.

Injury and trauma.—Some of the most serious and most troublesome fistulæ that I have been called upon to treat have been due to the injection treatment of piles. It is only fair to say that in all these patients—and there have been quite a number—the treatment has been carried out badly, and in most of them urea-quinine hydrochloride has been used for the injection instead of carbolic. There has been no case of fistula in St. Mark's Hospital as the result of the injection treatment of piles, to my knowledge, in spite of the fact that some 80

* A post-graduate lecture delivered at St. Mark's Hospital on Feb. 6th, 1936.

injections a week are given here. When the treatment is carried out inexpertly, however, an abscess may result, and this is likely to lead to a very bad type of fistula. I had a patient recently who had to have five operations and it took over a year before the condition was healed; one track went up to the promontory of the sacrum.

Another cause of traumatic fistula, of which I have seen several cases in the last few years, is the treatment of rectal carcinoma with radium. The insertion of radon seeds or radium needles in the neighbourhood of the rectum is very liable to set up an abscess, and a fistula results. These cases are particularly troublesome, as, owing to the action of the radium, there is very great difficulty in getting the parts to heal. No attempt can be made to do more than just provide adequate drainage to the infected tissues.

TREATMENT

In practically all cases the initial lesion is an abscess of which the fistula is a secondary development. If the initial abscess is opened at the earliest possible opportunity and free drainage established to the exterior, or into the bowel, about 70 per cent. of such abscesses will heal without resulting in a fistula. For this to occur it is necessary that the abscess should be opened before there is any large accumulation of pus and within at least 30 hours of its formation. Very free drainage, also, should be provided and the cavity should not be packed with gauze or any foreign body introduced. This method of draining abscesses was advocated by me in 1923³; it has now been used in St. Mark's for a number of years and is found to greatly reduce the incidence of fistula. It consists of cutting away the skin over the abscess cavity so as to leave a large opening and applying a wet compress to the outside. No packing is used, nor any drainage introduced, and there is no interference at all with the interior of the abscess. Too often what happens is that the abscess is left until it bursts through the skin, or into the bowel, or else an inadequate opening is made into it. Once a fistula has formed there is only one method of treatment that can be effective—namely, an operation to lay open and drain all the tracks.

A certain proportion of fistula can be cured by quite a simple operation, but I have no hesitation in saying that very many require considerable experience and much skill, if satisfactory healing is to be obtained, and that of all the cases which come into St. Mark's Hospital for treatment the fistula cases are the most difficult, and I am not excluding excision of the rectum for cancer. Hardly two are alike and each requires special study. A fistula operation is not a major operation and should never endanger life, but it is very far from being a minor one. More surgeons' reputations are damaged by unsuccessful operation for fistula than by laparotomies. The bad results of laparotomy are generally buried with flowers, while the fistulæ go about the world exhibiting the unsuccessful results of the treatment.

While it is impossible to describe any one method of operating for fistula, since there is too much variation in the conditions found, there are nevertheless certain broad principles involved in successful treatment which deserve our serious consideration. None of the many attempts that have been made to classify fistulæ is, in my own opinion, satisfactory, nor can they ever be, since fistulæ-in-ano do not lend themselves to any satisfactory classification. There is an infinite variety.

PLANNING THE OPERATION

Our object in operating upon any fistula is to obtain sound and permanent healing in the minimum time and with the least inconvenience to the patient. The first consideration, however, is to obtain good, sound healing, and although this can be occasionally secured when the patient is allowed to walk about this is seldom worth attempting, and I prefer to have the patient in bed during the whole period of convalescence.

The first principle involved in curing a fistula is to provide free drainage to all the fistulous tracks. It is, however, not sufficient to provide drainage at the time of the operation, but so to plan the wound that free drainage can be maintained during the whole period of healing. In dealing with a fistula wound we are forced to make use of healing by granulation, since healing by first intention is not possible, and a proper understanding of how to get sound healing by "third intention," as it is often called, is essential to success. All tracks must be freely opened up, but if the fistula is very extensive or goes very deep, it is often inadvisable to do this all at one sitting, as it may involve too extensive damage to the muscular structures, or lead to deformity of the parts. Hence, it is often better to plan the operation in several stages.

When complete division of all the tracks will involve complete division of the external sphincter, the operation should always be performed in two stages, the division of the muscle being left to the second stage, when the remainder of the wound has to a large extent already healed. There is usually, one might almost say always, a track opening into the anal canal, what we call the internal opening, but in only a minority of patients does this open above the external sphincter, and its division, therefore, involve division of this muscle. However many external openings there may be it is almost an invariable rule that there is only one internal opening, and it is well to bear that in mind. In most cases this internal opening is in the midline and usually posterior.

When possible the wound should be so planned that the portion of it involving the skin is considerably wider and larger than the portion involving the mucous membrane and the bowel; this will often require what at first appears to be an unnecessarily large wound. When operating at St. Mark's I have often found that onlookers have been surprised at the amount of skin which I have cut away, no less than at the fact that the sphincter muscle has not been cut at all. The object of cutting away so large a proportion of skin is to provide a free opening to the fistulous track, which will remain a free opening until the track itself is healed.

A very common mistake in operating for fistula is to miss one of the main tracks, and when this happens it invariably leads to failure. The track that is most commonly missed, in my experience, is that passing across from one ischio-rectal fossa to the other, behind the anal canal. This is often present even in a fistula which appears at first to be confined to one ischio-rectal fossa only; it may also occasionally be multiple.

We have first to satisfy ourselves that we have laid open all the tracks, and for this purpose the eyes and fingers are the best guide. I have found that radiograms with Lipiodol and the injection of the fistulous tracks with dyes are most misleading and do not help. When the parts are laid open

it is usually quite easy, if one has experience, to detect the openings of unsuspected tracks or to feel them with the fingers.

The next thing is to decide whether we are going simply to leave the wound open to granulate, or if we should remove all the fibrous tracks. If the latter can be done successfully, healing will be sounder and much more rapid than if the dense fibrous tracks are left, since they are naturally composed of poor healing material. The decision will depend upon the knowledge and skill of the surgeon, but he must bear in mind that it is quite useless to remove only part of the tracks. When the tracks are very extensive and extend very deeply it is usually impracticable to remove them without the danger of damaging the muscular apparatus, or the rectum itself. When this is the case the wound should be simply left to granulate, being carefully, but very lightly, packed with wool or ribbon gauze. Wool is better as a rule, since being unwoven those fibres that become involved in granulation tissue can be left and the remainder washed out. While a woven material will all have to come away in one piece, and the granulating wall most certainly damaged, which is what we wish to avoid. To allow the granulation wall to form packing should be left undisturbed for at least three days and then soaked out in a bath, after which it should be changed twice a day, great care being taken to pack the wound lightly and not to damage the healing surfaces.

If the surgeon decides that it is feasible to remove all the fibrous tracks, this should be done. The first finger of the left hand should be kept in the rectum to act as a guide and prevent accidental damage to the bowel or the musculature. Every bit of fibrous track should be dissected out with the greatest care so as not to leave anything but healthy fat. Bleeding points should, if possible, be twisted rather than ligated, as healing will occur much better if foreign bodies in the form of catgut are not left in the tissues. If ligatures have to be used, they should consist of the finest catgut only and should be as few as possible.

Having completed the operation the wounds should all be well swabbed out with strong Monsol or some other suitable antiseptic. A good area of skin should be removed in order to leave really free drainage, and a wet antiseptic compress applied outside. As a rule no packing at all should be inserted, as we want the whole wound to collapse and the fatty walls to adhere to each other. The wound must be carefully watched daily during the next few days to see that no pockets, or residual cavities, have formed in the deeper parts, but on no account should a probe be used. A finger can be passed into the rectum and the deeper part of the wound squeezed to see if any cavity is left. If a track, or a cavity is discovered, it must be lightly packed and treated in the ordinary way. If the treatment is successful it will be found that instead of a deep wound or wounds, there is only a large and quite superficial one, which heals up rapidly without much trouble. A very great saving of time can often be obtained by this method of operating, as even if only the deeper parts heal by first intention the resulting wound will be smaller and heal more easily than if treated in the more orthodox manner.

The after-treatment of a case of fistula is most important and personally I do not undertake to operate for a fistula unless I can supervise the after-treatment myself. Dressings should be changed twice daily at first, and the patient should soak himself in a hot bath before removal of the dressings. Antiseptics

should be discarded after the first three or four days and the wound should be lightly packed with gauze or wool soaked with castor oil.

TREATMENT FOR SPECIAL KINDS OF FISTULA

In a fistula where the internal opening is to one side and the division of the track will involve dividing the external sphincter, the operation should always be done in two stages. The track leading to the internal opening is not divided until the external wound has healed down to it.

Submucous tracks running up the bowel should be divided into the rectum and the edges trimmed away to give good and sufficient drainage. This is not difficult, but there may be some trouble in controlling the bleeding if the track passes high up the bowel. These tracks can be divided with a cautery, or the bleeding controlled by a large tube in the rectum, and by packing. In a few cases it may be necessary to make use of the elastic ligature to divide such tracks owing to the impossibility of controlling the bleeding if they are divided with a knife.

Very high tracks which pass outside the muscular coat are fortunately very unusual. When they do occur they are the cause of much anxiety as they are very difficult and sometimes impossible to deal with adequately. They cannot be completely laid open into the bowel, as they would involve too much damage to the musculature. As free drainage as possible should be provided for and the deep parts of the wound drained with tubes suitably disposed. They may sometimes be healed by injecting the deep tracks with acriflavine in anhydrous glycerin, or of silver nitrate grs. 20 to the ounce.

Tuberculous fistulae.—The treatment of these patients should be on conservative lines. It is useless to expect healing of a tuberculous fistula in a patient who is losing weight and suffering from active tubercle in the lungs or elsewhere. If there is not satisfactory drainage of the tracks this should be established by the simplest method and the patient at once sent to a sanatorium or put under proper conditions of fresh air and sunshine, the local treatment being entirely subordinate to the general treatment for tubercle. When the patient's general condition has improved, and he is putting on weight and is in a good state of resistance, the fistula can be treated in the usual way. As there is always a risk of spreading the tuberculous infection into healthy tissue or to other parts of the body by the lymphatics, it is better to use a diathermy knife or an actual cautery rather than a scalpel.

Sacrococcygeal fistulae.—The only thing necessary to get satisfactory healing is to excise all the tracks completely right down to the fascia overlying the bone. The wound should be left open to granulate.

When the fistula wound shows signs of not healing, the first thing to do is to examine it very carefully to make sure that there is no fresh track or one that has been missed, and to make sure that there is free drainage. A properly healing fistula wound should show no obvious pus after the first week and the presence of pus generally indicates a deep and unnoticed track or bridging in some part of the wound. Poor or insufficient drainage is usually the cause of the trouble and should be remedied by laying the wound open again. Too tight packing is sometimes the cause; all packing should be as loose as possible.

At a special hospital like St. Mark's we not unnaturally get some very bad cases of fistula. The cases which have been unsuccessfully treated

elsewhere are frequently sent here and such cases come from all over the world. Many of them are real problems and require most careful treatment, but I am thankful to say that we are almost invariably able to send them home cured in the end.

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A CASE SHOWING AN UNUSUAL RELATIONSHIP BETWEEN ASTHMA AND EPILEPSY

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X. Y. was born in January, 1921. There is no record of either epilepsy or asthma in the family history. At the age of 10 she began to suffer from asthma, accompanied by bronchitis, and also from epilepsy. From the first, according to the father's statement, the fits always occurred at the end of the asthmatic attack. X ray examination at Guy's Hospital was negative, and there was no evidence of tuberculosis. The patient spent several months at the Downs Hospital.

She was admitted to the Lingfield Epileptic Colony in November, 1933. At that time it was stated that the

dyspnoic attacks were increasing in frequency, and the more severe ones were terminated by a major epileptic fit. At the time of admission the general condition of the patient was poor. No abnormality in the central nervous system was found. The chest wall was thin and there was a depressed sternal sulcus. Posteriorly there was relative dullness at the right apex and left base, with tubular breathing at the left apex. A few scattered crepitations were heard, especially in the left axilla.

For the first few months after admission there was persistent cough with fairly frequent attacks of definite dyspnoea at night. Six of these attacks, which were more severe than the rest, ended up, when the patient was very cyanosed, with typical epileptic fits. In the summer of 1934 the bronchitis cleared up and the asthma ceased. The signs in the chest, which had varied a good deal from time to time, disappeared. The patient began to gain weight rapidly and is now fat and healthy. There has been no recurrence of the epileptic attacks. From the first treatment was directed to the alleviation of the chest condition, and no medicine was given to control the fits.

A good deal has been written about the connexion between epilepsy and asthma, and it has often been suggested that they are both allergic manifestations. In some cases where they coexist it seems that the two types of attack may replace each other. In one case at present at Lingfield it certainly seems that when the fits are frequent the asthmatic attacks are fewer, and vice versa.

But so far as we know a case of this kind, when the epileptic fits only occur at the culmination of severe attacks of asthma, when there is considerable cyanosis, has not been reported before. With cyanosis, no doubt, the cerebral cells have insufficient oxygen, but other clinical conditions which cause cyanosis do not also cause epileptic fits.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF OTOLOGY

At a meeting of this section on March 6th, under the presidency of Mr. HAROLD KISCH, a discussion on

Disturbances of Function of the Ear Following Injury

was opened by Dr. G. KELEMEN (Budapest) who divided injuries into (a) those in which the petrous bone shared in general damage to other parts of the skull, (b) those in which the injury was limited to a disturbance of the sense of hearing or that of equilibrium. During the late war, he said, the former group was frequent; in peace time the latter were the more prevalent. In recent years disturbances of hearing and equilibrium had been studied in factories where both faculties were endangered. The consequences were divisible into (1) those in which secondary inflammation was the important factor, (2) those in which the injury of the terminal nerve organ was not complicated by inflammation, or at least where the associated suppuration was not the most important factor. For insurance or forensic purposes injuries of the ear were classified according to their symptoms; for diagnosis and treatment according to their localisation. The commonest fractures were longitudinal in front of or behind the pyramid; they might cross the labyrinth and, out of sight of the otoscope, involve important parts of the sense organs. Fractures might also present a route for intracranial complications via the internal auditory meatus.

In most cases the line of fracture was independent of the direction of the blow and of the site of the injury. It descended from the squama to pass round the capsule of the labyrinth. The eighth nerve might be injured (1) at its commencement in the narrow interosseous channels, (2) later where it ran, more loosely, in the internal auditory meatus, (3) in a funnel-shaped cavity, sometimes with a spur of bone narrowing the opening. It was at this narrowed spot that the nerve itself was apt to suffer damage; in other parts of its course the injury might be perineural. Inflammatory disease of the ear was of many varieties, from the simple otitis of the new-born infant to the formation of cholesteatoma. Bleeding between the layers of the tympanic membrane might detach the inner layer from the handle of the malleus; it did not necessarily lead to perforation. Injury might cause cysts, secondary inflammation in which led to development of the cholesteatomatous sac.

A splinter of bone under the intact skin of the meatus might be taken for a simple swelling of soft parts, when it really implied a fracture. A skiagram was apt to mislead unless taken from various angles. The tegmen tympani lay so close to the facial nerve and its geniculate ganglion that a fracture in this region might easily involve that nerve. Hæmorrhages in the cochlea might result in disturbance of hearing like tinnitus, or in deficient perception of certain notes. Defective hearing was frequently observed in association with injuries to the head, as Kisch pointed out, even when visible signs of fracture of the skull were lacking. Fracture of the tegmen might involve the dura and endocranium. Patients might die of meningitis months after

apparent recovery from fracture of the base of the skull. More radical measures were required for traumatic than for non-traumatic suppurative cases. Lesions due to trauma were serious in proportion to the degree of secondary inflammation; treatment should be on general principles.

Mr. E. D. D. DAVIS said that in compensation cases following motoring accidents disturbances of the function of the ear were frequently seen. He confined his remarks to internal ear or nerve deafness. The difficult cases were those of alleged concussion deafness, in which it was assumed there was an internal ear, labyrinthine, or nerve deafness arising from the concussion associated with head injury. In civil life nerve deafness as a result of injury was in his experience rare. Lannois and Chavanne reported that in 262 cases of simple labyrinthitis only 5 per cent. had almost total and apparently incurable deafness. The drum mechanism acted as a protection against the effect of explosions on the internal ear. During the late war, when ear injuries were common, cases of nerve deafness were divided into three groups: (1) with structural and permanent damage to the internal ear, (2) psychical or functional deafness, (3) temporary deafness. Cases in group (1) showed evidence of severe injury, such as bleeding from the ear, escape of cerebrospinal fluid, prolonged loss of consciousness, paralysis of cranial nerves, particularly the facial, and other brain injuries. There was tinnitus and vertigo, and obvious trauma of the ear. The deafness was permanent with loss of perception of high notes. X ray photography might show a fracture involving the labyrinth. Group (2) included patients who feigned deafness and even loss of voice; there were unexplained nervous phenomena, contradictory results from hearing tests, and no keen desire for recovery. There might be definite opposition to examination, and the structure of the ear showed no sign of injury. Group (3) consisted of cases of temporary deafness regarded as due to concussion, shock, or explosion. After a few weeks' rest these cases usually recovered. If genuine deafness remained after six months it was usually permanent. Many cases of shell concussion recovered rapidly. Well-marked cases of concussion deafness showed exaggerated reflexes, tremors, vasomotor disturbances, vertigo, and headache. Absence of signs of trauma to the ear and a normal caloric reaction in the labyrinth indicated the temporary nature of the deafness. A forgotten inflammatory or other ear disease, especially otosclerosis, might be revealed by scarring and opacities of the drum. In compensation cases Mr. Davis urged that medical witnesses on both sides should meet and try to agree as to the nature of the case. A ruptured drum required rest in bed, without local treatment; the meatus was cleaned and the ear left alone.

Mr. HERBERT TILLEY referred to the case of a man, aged 69, who was standing on a railway platform when an engine near emitted a shrill shriek; he put his hands to his ears and said it felt as if a knife had been stuck into each ear. There was tinnitus for a short time, but no vertigo. The deafness following had been extreme, and he felt it greatly as he was very musical. He found difficulty in carrying out the duties of his post. The insurance company denied that it was an accident and disclaimed responsibility.

Sir JAMES DUNDAS-GRANT said that cases of concussion often were benefited by small doses of perchloride of mercury.

Mr. SYDNEY SCOTT, referring to a statement that not more than 5 per cent. of cases of fracture of the

base had nerve deafness, said the probable reason of that small proportion was that many cases of fracture of the petrous bone were fatal. One such patient of his, however, survived for 20 years. He was a railway guard who was flung from one end of his van to another and was concussed. There was deafness with absolute loss of labyrinthine reactions, and bilateral rupture of the auditory nerve was diagnosed.

Mr. E. DEACON said that in a series of 230 cases of fracture of the skull 33 survived, and of the latter 11 had an acute suppurative condition of the ear. On 5 of them he performed the operation for acute mastoid disease. There was no tinnitus and no vertigo.

OTOSCLEROSIS ASSOCIATED WITH BLUE SCLEROTICS AND FRAGILITAS OSSIUM

Mr. T. RITCHIE RODGER referred to a case shown by Mr. Cleminson in 1926. Ten years before that van de Hoeve and de Kleijn had pointed out the frequent association of otosclerosis with blue sclerotics and imperfect osteogenesis. Julia Bell found that 60 per cent. of adults with blue sclerotics were deaf and the same proportion had fragile bones, while 44 per cent. had both. Inheritance was usually dominant, but there were exceptions. There was no such sex preference as was found in otosclerosis, but affected females had a slightly higher percentage of affected offspring than a corresponding number of affected males. Otosclerosis did not develop until the third decade, and transmission was generally direct; in one of his families two generations were skipped. Cockayne believed that both mesodermic and ectodermic defects were determined by a single dominant gene. The sella turcica seemed to be contracted, as if the pituitary body had not developed properly. There were often deformities apart from fractures. The deafness and the changes in the petrous bone were typical of otosclerosis. Mr. Rodger wondered whether the inheritance factor might not lead to some secondary metabolic difficulty which could be circumvented in time to prevent the onset of deafness.

Prof. NAGER (Zürich) said the bone process in otosclerosis was similar to that in fragilitas ossium, where there was also a defect of the osteoblasts. In otosclerosis there must be an endocrine factor, because the condition usually started at puberty and the symptoms arose only at the moment that the joint was attacked. The process might be present in the capsular part without showing symptoms. Treatment with thyroxine often reduced the tinnitus. Hyperparathyroidism, which bore many similarities to otosclerosis, had been produced by intoxication with certain vitamins.

Mr. F. J. CLEMINSON remarked on the wide distribution in some cases of the otosclerotic changes. The late Dr. Albert Gray had stated that otosclerosis invariably began in, and was for long confined to, the region of the fenestra ovalis.

NEWARK HOSPITAL.—Last year workpeople subscribed the record sum of over £2000 to this institution, but the authorities would like to see the subscription list equal the voluntary levy. The average cost per bed here has been reduced from £101 to £97 12s. 7d., and the length of stay of in-patients from 22 to 20 days.

HUNTERIAN SOCIETY

INTRODUCING a discussion on March 16th at a meeting of this society (Dr. W. BRANDER, the president, being in the chair) on the subject of

Fatigue

Dr. ADOLPHE ABRAHAMS said that among the presenting symptoms for which practitioners were most commonly consulted were tiredness, or one of its equivalents, lack of energy, premature exhaustion, undue fatigue, lassitude. Certain serious pathological states—myasthenia gravis, Addison's disease, malignant disease, Addisonian anæmia, diabetes, tuberculosis, post-influenzal debility—were accompanied by asthenia. But the majority of patients who complained of chronic fatigue were not suffering from any serious or indeed any disease at all, nor as they alleged from over-work; they were simply bored. Yet it was a matter of common experience that the amount of congenial work which even an average person could undertake was colossal. Dr. Abrahams here related a personal experience.

"When I was a house surgeon at St. Bartholomew's," he said, "the practice—whether or no it obtains to-day—was to go on full duty every week-end in five, when from midday Friday until midday Tuesday you were responsible, in addition to your routine duties, for every surgical emergency. I recall one such full duty when through continuous pressure I never completely undressed during the four days and nights. It happened moreover that for most of that week-end there was a dense fog, and as a consequence I lost all distinction between day and night, all conception of time. I experienced a sense not of fatigue but of supreme happiness, the memory of which persists to this day. I recall a similar experience during the war; but it is superfluous to elaborate what everyone here has also encountered: periods of continuous intense work congenial and satisfactory to be contrasted with the sense of exhaustion only too inevitable when the work, though far less exacting, is of a nature which is for one reason or another uninteresting and unprofitable."

We were all agreed, Dr. Abrahams continued, that work as such never caused a breakdown; some mental conflict must be present. Of course when patients came with the story of recent gross reduction in their ability to undertake exertion, physical or mental, it was natural to try to identify some responsible toxin, acting as a brake upon the machinery of activity. We admitted the influence of certain accepted toxins—tuberculosis, malignancy, influenza—but what were we to say of the more elusive toxins in focal sepsis? Once determined to incriminate some such abnormality and having excluded the accessible teeth, tonsils, sinuses, prostate, gall-bladder, appendix, and pelvic organs, there remained the almost unlimited field provided by the alimentary canal. Contemporary advertisements discovered here the invariable cause of tiredness and sought its cure in suitable pabulum or the eradication of intestinal poisons. But both the scientifically minded physician with his toxins and the more matter-of-fact practitioner who accepts the idea of boredom must not forget the psychologist who finds in fatigue a defence against anxiety or the undertaking of responsibility or even Nature's protection against over-exertion.

Dr. Abrahams then turned to the problem of fatigue as an accepted physical consequence of muscular exercise. Fatigue is due to exhaustion of the substances required for the supply of energy or more exactly to the accumulation of sarco-lactic acid, the excess which the blood stream is unable to wash out. If exercise is of such severity that the lactic

acid produced is no more than can be removed simultaneously by oxidation—accepting as the maximum intake of oxygen four litres a minute—fatigue will not occur until other factors of exhaustion enter into the problem. But with really violent exercise the generation of lactic acid is far too considerable for its elimination—e.g., in the case of a sprinter, 1 gramme of lactic acid accumulates for every stride taken, i.e., 40 grammes in the hundred yards. Athletic training to some extent consists in perfecting the circulation for the removal of lactic acid, but it also embodies the education of the muscles to neutralise fatigue products or perhaps to tolerate their presence. The great athlete, Dr. Abrahams thinks, has muscles constitutionally superior in this respect. Perhaps the maximum accumulation of lactic acid possible to the most highly trained individual is 120 grammes. Furthermore the capacity to resist fatigue is bound up with the willingness to push oneself to the last degree; the seat of fatigue is in the nervous system and the available reserve is immeasurable. In long-continued exercise of submaximal severity, fatigue may be due to shortage of fuel. American experiments upon marathon runners had shown an exact correlation between exhaustion and hypoglycæmia which Dr. Abrahams had been unable to confirm. But exhaustion during a substantial athletic effort was a disturbed mechanism concerned with several widely different factors; for in addition to the shortage of fuel, to the accumulation of lactic acid, to the element of monotony, there was the prevention of loss of heat and of moisture under certain unfavourable conditions. The lassitude often experienced on the day or days following a severe effort had been attributed to myocardial weakness and the same explanation had been applied to the incapacity for effort after bacterial illness, especially influenza. "I am unable," he said, "to agree that any direct cardiac association need be invoked. After all, the muscular metabolites must have an effect upon the central nervous system and to this I attribute protracted and delayed fatigue, and, I may add, the symptoms which are on insufficient evidence accepted as 'heart-strain'."

MENTAL FATIGUE

Dr. C. S. MYERS, F.R.S., said that fatigue is usually defined as "that state of lessened activity of an organ which results from its previous activity." But so varied are the effects of prolonged mental work, so complex and so widespread is the "organ" of mind, and so ignorant are we of the nature of mental activity that a correspondingly succinct definition of mental fatigue would fail to serve any useful purpose. On grounds of physiological analogy, we might at first be disposed to attribute mental fatigue to the exhaustion of locally available mental "energy." But the only apparent evidence that we had of such a cause of mental fatigue related to structures outside the central nervous system—namely, in the effects on consciousness produced by stimulating the "protopathic" or "spot" system of sensibility. These effects were easily observable in the skin; where, if any one heat spot or cold spot is re-excited immediately after its previous stimulation, it would fail to elicit a second sensation. Its previous response, comparable perhaps to an explosion, had apparently resulted in complete exhaustion: rest is needed for its recovery. But there were other sensations, if not too intense, which seemed virtually indefatigable. We can listen almost eternally to the gentle ticking of a clock or endure, likewise without apparent sensory fatigue, the

continuous daylight of a northern summer. There are other prolonged but more intense sensations—e.g., the hearing of a continuous loud tone, which, while not suffering appreciable change themselves, nevertheless—owing, it is believed, to central inhibition—result in a rise of the threshold of hearing for tones of the same and of neighbouring pitch. So far as cerebral fatigue is concerned, it might be wondered whether any impairment of mental activity would be expected either through the exhaustion of locally available energy or through the accumulation of toxic influences due to its exercise. Conscious processes however seemed to involve the activity of extensive areas of the brain functioning as a whole; the notion of “centres of consciousness” was fast becoming obsolete.

Uninterrupted concentration at any task, Dr. Myers said, is unnatural; it is our nature to take repeated brief rests during any long period of mental work. But whereas the uninterrupted maintenance of mental activity in one particular field of attention cannot endure for long, the freer play of phantasy in day-dreaming and in sleep seemed untiring. Feelings of mental weariness are not invariably a faithful index of mental impairment; lessened output of mental work may indicate that we are mentally fatigued without our necessarily feeling so, or we may feel mentally fatigued without necessarily showing it in poorer work. Measurement of the output of work was at present our most trustworthy index of mental fatigue, for unfortunately we have no sufficiently reliable objective tests of mental fatigue. Purely physiological tests have proved of little use. Periodically interpolated mental tests are at the mercy of the will and of the feelings of the subject; they are also subject to the effects of practice and of consequent automatism; and they differ, owing to their necessary simplicity, from the more complex directive, aim-seeking characters of higher mental work. There can however be no doubt that, in general, the efficiency of performing certain interpolated mental (e.g., arithmetical) tests is lowered by continuous mental work. Both the feeling of mental fatigue and fatiguability showed vast individual differences. The obsessional type of psychoneurotic might be kept by his abnormally strong perseveration incessantly at work when the normal worker would be unable to resist from taking protective rests. Especially he, but also even the best balanced and most vigorous person, under sufficiently prolonged or intense mental activity would ultimately suffer, sometimes quite suddenly, from pathological fatigue or so-called mental breakdown. Extreme muscular fatigue had never been shown to cause mental breakdown.

Some light was thrown on the pathology of mental breakdown by considering the effects of prolonged activity at the lowest levels of the central nervous system. As the spinal flexion reflex tires under continuous excitation or frequent excitation, it becomes weaker and more tremulous, and may finally even cease altogether. But during this fading there occur brief periods of intermission and even of replacement by the antagonistic response of extension; inhibited movements are more ready to break through. The same occurs when we are at work in some particular field of mental activity. Antagonistic and irrelevant fields of attention are successfully inhibited, at first without voluntary effort owing to the incentive of interest, but later, as interest wanes and boredom enters, through the exercise of volition. Finally as this directive activity of the will fails through fatigue, we can no longer, despite the utmost

effort, attend to the work on which concentration is required. Thus local boredom gives place to general fatigue. Continued cortical stimulation of the flexor area results in a facilitated increasing response, then to a rise in sensitivity of the antagonistic extensor area, and finally to a quasi-epileptiform wave of movement spreading to neighbouring motor areas. These changes were in some aspects analogous to the collapse of the higher coördinating centres and to the wasteful dissipation and short-circuiting of energy, characteristic of mental breakdown through overwork.

It seems, Dr. Myers concluded, that mental fatigue is most evident and serious when the work is of a kind that demands concentration of attention, and that then its most prominent feature is a collapse of “directive activity” which manifests itself in impairment and distraction of attention, loss of skill and deficient effort, in irritability and other symptoms of loss of self-control, and finally in more serious disorders of volition, cognition, and emotion. But in addition to such fatigue of volitional direction, there is likewise a fatigue of the mental processes which are subject to such direction.

But, he added, we do not know what occurs when fatigue sets in. We may conjecture that synaptic resistances are increased, or that adverse chemical bodies are formed, like acetylcholine, neurogenic and humoral in nature, or resembling in their action the toxins generated by excessive muscular activity. It may also be that antitoxins can be formed, resistant to such fatigue. But we are as ignorant of these as we are ignorant of the supposed toxins and antitoxins responsible for, or defensive against, sleep. We are also ignorant of the differences which are likely between the fatigue caused by intensive or prolonged mental work and the fatigue caused by deprivation of sleep.

FATIGUE IN INDUSTRY

Dr. J. C. BRIDGE said that in his visits to centres of industry he had been impressed by the ability of workers to continue at heavy tasks for eight or more hours every day of the working week; he felt sure that part of the explanation lay in the fact that the work was not actually continuous, but the men had “breathers,” intervals of rest between the tasks. Mechanisation too in recent years had done much to reduce the muscular energy necessary at many of the heavier kinds of work. He assumed there was a physiological fatigue which was good, and healthy, but he knew of no means of determining subjectively where this ended and pathological fatigue began. A recent move was to substitute for three eight-hourly shifts four six-hourly ones; one result of that change had been to increase the output. Repetitive work in attending to machines of uncanny complexity must produce in the worker a sense of boredom or fatigue. In making clothing the component articles were sent along on a continuous band; workers along its path had a set piece of work to finish before the garment was passed on to the next. That kind of monotony was well calculated to produce fatigue. When intervals of rest were allowed, many of the women occupied themselves with knitting! He could only presume that no more than a small part of the human anatomy became fatigued by the work. Fatigue in industry had been for some time diminishing, and was still being reduced, but its form varied owing to the changing forms of employment. Study of these was important.

DISCUSSION

Dr. GUY P. CROWDEN found it impossible to regard fatigue as a single entity; he found himself unable to isolate it from what appeared to be the daily cycle of every active person. The problem to be faced was: is the phase of recovery a real and full compensation for the expenditure of energy? At the end of a day, and at the end of the week, fatigue had overtaken recovery and—speaking from the physiological standpoint—there was some leeway to be made up. Did the routine of life permit the day-to-day equilibration of that cycle? One could not assume a dominating influence preventing equilibration apart from many factors known to influence fatigue and recovery. In the case of the worker distinction must be made between dynamic fatigue as a result of movement efforts, and static in which there was fixed attention with possible strain. There was too the factor of environment. Some work was done in comfort; ventilation, humidity, air movement, and radiant heat were important, as well as distractions due to noise or vibration, not forgetting air pressure (caisson work). In all this it was impossible to ignore the personal factor; much depended on whether the person concerned was educated and able to appreciate the significance of changes in routine, the regulation of light, and even the wearing of protective garments. Some single and apparently trivial factor might turn out to be the chief cause. A person engaged at a desk might be at work which involved postural strain, and he might suffer considerable fatigue in local muscle groups. Fatigue meant a diminution of capacity as assessed by the previous optimum of physical fitness. A further factor of real importance was that of appropriate and sufficient food, linked up with congenial home conditions.

Dr. R. K. HOWAT argued that the process of recovery from fatigue was never complete. It was true that after a period of rest one might feel as fresh as ever, but that did not mean complete recovery. Every living creature entered on life with a definite reserve of energy, and even with sufficient food and periods of rest there was a danger of being on the wrong side in the matter of equilibration. Fatigue might be a protective agency against complete exhaustion.

Dr. STEWART WEBB regarded fatigue as largely individual; many were content to perform the most monotonous tasks so long as they were not called on to bear any responsibility.

Dr. H. L. ATTWATER spoke of the delicate and exacting work involved in making filament lamps, the suspension of the filament occupying about ten seconds each. Monotony was countered by the offer of bonuses to those who dealt with the largest number of lamps each week, and there were no complaints of fatigue. On the other hand, those who had to produce dies for very fine work only put in short hours and did suffer from fatigue.

Mr. HOPE CARLTON agreed that fatigue was largely central, and the question of shock was important. A boxer who had been knocked out was suffering from fatigue, and that was a central lesion. Discipline also had much to say. During the late war the endurance of a trained battalion as compared with that of new recruits was largely a question of superior discipline. Recent work at Down Farm on fatigue in smooth muscle had disposed of old ideas on the subject; there was no deficiency of blood chlorides, even up to the point of death. Fatigue was not due to histamine bodies; the death-dealing substance lay in the cell.

Dr. LETITIA FAIRFIELD insisted on the importance of rhythm, which became evident on watching the methods which workers chose for themselves. Children's favourite method of doing things was to attack them in bursts of energy, alternated with periods of rest, and if allowed to carry on as they pleased they were quite fresh at the end of a long day; whereas if a certain procedure was imposed on them they soon tired of the task. When a person's whole desire and interest was concentrated on his work, this had the effect of postponing and diminishing the amount of fatigue. Men working at exacting occupations for long hours during the late war would not confess to fatigue although their muscles were twitching and they were evidently spent. Absence of mental conflict was very important.

Dr. ABRAHAMS in replying said it was usually the fussy person who was particular about the athlete's diet; the great athletes did not bother about it. Also, the record-breaker was not usually the educated person; if he were he would commence to reason while at his running, and the first question he would ask would be, "Why am I doing it? Is it worth while?"

LIVERPOOL MEDICAL INSTITUTION

A MEETING of this institution on Feb. 27th, with Mr. G. C. E. SIMPSON, the president, in the chair, was devoted to short papers on problems in general practice.

Treatment of Psoriasis

Dr. R. M. B. MACKENNA said that certain definite precautions should be taken by persons prone to psoriasis; they should not wear tight clothing, they should avoid alcohol, foods containing spices, and fatty foods, and as a rule they should expose themselves to sunlight as much as possible. With a severe attack in the stage of efflorescence, an expectant line of treatment should be adopted; rest in bed was a measure which was usually omitted but often did more good than any other.

In the discussion which followed, Dr. F. GLYN-HUGHES, in reference to Dr. MacKenna's mention of German work supporting the idea of faulty fat metabolism in psoriasis, said that until two months ago it had been his practice in Belmont-road Skin Hospital to put all his psoriasis patients on a fat-free diet. He was satisfied that this had decreased the time required to clear the skin. Lately he had gone further and put these patients on a milk diet only, and had been very pleased with the result, particularly in very chronic cases. The method had the advantage that it could be carried out at home. Speaking of the use of intramuscular injections of mercury, he said he would like to be sure that their good results were due to the action of the drug on the disease proper, and not to its action on syphilis, which could produce lesions closely resembling those of psoriasis. The Wassermann reaction in these cases was not always reliable.

Dr. G. S. SWAN said that psoriasis was one of the bugbears of a general practitioner's life. His main object was a form of treatment to enable the patient to continue his employment. Baths twice daily, followed by complete inunction, were almost impossible of achievement outside hospital.

Phlyctenular Conjunctivitis

Mr. A. MCKIE REID, in a paper on the aetiology and treatment of phlyctenular conjunctivitis, began

by pointing out its association with cervical adenitis, pathological tonsils and adenoids, occasional bone and joint disease, and with hilar and abdominal tubercle. The lesion showed neither tubercle bacilli, true giant-cells, nor caseation, and the evidence in favour of its being tuberculous was chiefly clinical and experimental. The occurrence of phlyctenules when sacs of tubercle bacilli were tied in the body of non-tuberculous animals, when external irritants (e.g., staphylococcal toxin) were introduced into the conjunctival sac of tuberculous animals, as a focal reaction after a skin-test and as a local reaction after a conjunctival test for tuberculosis, were quoted in support of the theory that the disease is a focal manifestation of systemic disease—a tuberculo-toxic manifestation in the allergised ocular epithelium. Treatment included local application of unglyhydrarg. oxid. flav. and treatment of the accompanying catarrhal conjunctivitis with saline lavage and 2 per cent. mercurochrome drops (zinc and silver salts were contra-indicated). Improved hygiene, administration of vitamins, hyperalimentation, artificial sunlight, and, where systemic tuberculosis was present, institutional treatment were useful. The disease was much commoner in communities where economic and industrial conditions were bad, and Mr. Reid maintained that its prevention was essentially a sociological problem.

Dangers of Nose-blowing

Mr. JOHN ROBERTS said that the act of nose-blowing, although accepted as a necessary civilised convention, was not physiological, because normally the nasal secretions (with their entangled bacteria and dust) pass backwards into the pharynx and are swallowed. It seemed probable that the body, in this singular way, kept vaccinating itself against prevalent micro-organisms through the agency of the stomach and intestinal canal. By a consideration of the aerodynamics of the middle-ear cul-de-sac it could be clearly shown that the forced passage of air through a constricted nasal passage could easily impel some secretion (on its way past the orifice of the Eustachian tube) into the tympanic cavity—particularly if the tympanic membrane was absent or perforated. Clinical experience had conclusively shown the liability to acute otitis media following injudicious and forcible nose-blowing in such conditions as the common cold, measles, and scarlet fever, and also in swimmers and divers.

In the discussion, Mr. MCKIE REID said that vigorous nose-blowing immediately after excision of the lacrymal sac was sometimes followed by an alarming swelling of the eyelids suggesting cellulitis. This was surgical emphysema due to the tissue planes in the eyelids, laid open by the incision, being brought into direct communication with the intranasal cavity. The condition resolved quickly on the application of pressure-pads and abstention, [for a day or two, from nose-blowing.

Dr. W. B. BENNETT said that he considered the safest method was to "blow" each side of the nose separately, somewhat after the practice of the manual labourer, who closed one nostril with his finger, while he cleared the other, which remained open. A handkerchief could, of course, be held near the nose.

Dr. R. J. MARTIN said that blowing the nose was an expiratory movement resulting from irritation of the nasal mucous membrane. While normal ciliary action propelled debris downwards, to be disposed of by the acid gastric juice, this mechanism often needed assistance during modern conditions of town life. This assistance was provided by the acts of

sneezing, coughing, and blowing the nose. The danger of forcible nose-blowing arose when infected mucus lay at the entrance to the Eustachian tube, and infection of the middle-ear cleft was particularly likely to occur in those cases in which a dry perforation already existed in the tympanic membrane.

Mr. H. V. FORSTER read a paper on Tonsil Function and the Attitude to Tonsillectomy, and Mr. H. C. W. NUTTALL one on Septic Fingers.

ROYAL ACADEMY OF MEDICINE IN IRELAND

A MEETING of the section of obstetrics and gynæcology was held on Feb. 14th with Dr. J. F. CUNNINGHAM, the president, in the chair.

Sudden Death During Labour

THE PRESIDENT showed a specimen from a patient in whom a cardiac lesion caused death during labour.

The patient, a primipara aged 33, appeared to be quite normal when she came into hospital. Her lungs and heart were examined and nothing abnormal was found. There was no albumin in the urine. After she had been in labour for 12 hours it was thought that she was in the second stage. No vaginal examination was made. After she had been 15 hours in labour the head appeared on the vulva. The patient said that she could not see at all, her eyelids got very swollen and she became cyanosed. She was given chloroform and had a very easy low forceps delivery. She was given chloroform for only seven minutes. She died suddenly, and the baby was stillborn. Forceps were used because the patient was in great distress owing to the cyanosis. At post-mortem examination the abdominal organs and the brain were found to be normal. The lungs showed adhesions and evidence of old-standing pleurisy. There was moderate fatty infiltration of the heart, but the valves were normal. There was no evidence of endocarditis. The right ventricle was dilated, and the wall was extremely thin. There was an antemortem clot in the left ventricle.

Dr. Cunningham said he had previously seen two cases in which a clot had appeared, but it was in the right auricle or ventricle. This was the first time he had seen a clot in the left ventricle.

Dr. BETHEL SOLOMONS said that sudden death in labour had been attributed to various causes. "Labour shock" as a diagnosis usually meant ignorance of cause of death. Embolus, postpartum hæmorrhage, acute cardiac dilatation, and many other factors were blamed. In this case it was impossible to exclude chloroform as the cause. He still believed that chloroform was dangerous in hospital practice, whereas it was apparently safe in the hands of an experienced practitioner. The post-mortem specimen which had been shown did not solve the puzzle.

Dr. G. C. DOCKERAY said that the specimen reminded him of one in the College of Surgeons in which a large ball thrombus in one of the chambers of the heart had caused death. It was a good deal larger than the clot in this case, but presumably the mechanism was the same in both. Most chloroform fatalities seemed to occur in patients with perfectly normal hearts; so selection of patients for chloroform would probably make little difference. Many cases of so-called acute dilatation of the heart were really cases of tachycardia with, in addition, fibrillation.

Dr. F. DOYLE said that this was a case which would fill many people with alarm. There was nothing which could clinically suggest death, and it was very remarkable that death should have been so sudden.

Death might have been due to the anæsthetic, but apparently this was not so. Nitrous oxide and oxygen was in his opinion the proper anæsthetic for these cases. It would be interesting to know whether in this case the chloroform had really had any effect on the heart or not.

Dr. KERRY REDDIN said that in the last two months he had known of three patients with congenital heart disease who had been sent out of maternity hospitals undiagnosed. He thought there was great slackness in examining the hearts of the women and the babies in the maternity hospitals, and said that neither heart cases nor tuberculous cases were properly examined there.

The PRESIDENT, in replying, said that the absence of any clinical symptoms when the patient came into hospital first could be explained by the pathological report which said that she had no valvular lesion of the heart at all. When she became distressed and blue during labour it was very difficult to know the reason. He did not think that the anæsthetic had had anything at all to do with the death of the woman, and believed the cause of death must have been that the heart went through a great strain during labour; this strain increased towards the end of labour, and it was then that the anæsthetic was given. This death had not altered their routine in the hospital of giving chloroform. Every case on admission was examined to see if there was any heart lesion, and if there was, this was taken into consideration when an anæsthetic was being given.

Ovarian and Endometrial Graft

Dr. BETHEL SOLOMONS reported a case in which an ovary and a piece of functioning endometrium from the uterus were grafted from one woman to another. He knew of no similar recorded case. The patient had previously had years of amenorrhœa and much hormonal treatment had failed; but menstruation followed the operation.

The PRESIDENT said that this was probably the first time that an operation such as was described by Dr. Solomons had ever been performed. It was extremely interesting to hear of a graft of ovary and of endometrium being made at the same time. He thought it was common to find that a graft of an ovary into the rectus muscle failed. The ovary did not live very long. The graft often gave rise to pain, and later a cystic swelling sometimes appeared in the rectus muscle. It was noteworthy that the endometrium had an effect on the ovary as well as the ovary on the endometrium. He thought that very likely the endometrium was a ductless gland, and would have this effect. He wondered if it was the patient's own ovary which was now functioning, in which case the result would be likely to be more permanent. The patient's own ovary might have been stimulated by the operation; this would have an effect on the endometrium; and the endometrium in turn reacted on the ovary. It was fairly easy to graft endometrial tissue, but very difficult to graft ovarian tissue.

Dr. T. M. HEALY hoped that Dr. Solomons would report later on on the behaviour of the endometrium. It would be interesting to know the degree by which the uterus was covered with endometrium in six or eight months' time, and whether it was behaving as normal endometrium did in the ordinary individual. Dr. A. W. SPAIN and Dr. DOCKERAY spoke of the relation of blood groups to success in grafting.

Dr. SOLOMONS, in reply, said he thought a graft lasted for two or three years. He believed that the

menstruation, which had already occurred several times, was due to the presence of the grafted ovary and the endometrium.

Juvenile Rheumatism

Dr. C. J. MCSWEENEY addressed the Section of State Medicine on this subject at a meeting held on Feb. 28th with Dr. J. A. HARBISON, the president, in the chair. He began by saying that he thought rheumatism responsible directly or indirectly for 1500 deaths a year in the Irish Free State. His impression was that the disease was at least as common in Dublin as it was in the larger cities in England. It was essential to recognise that nowadays rheumatic manifestations in childhood were usually subacute, and even subclinical; hence the replacement of the term "acute" by the more precise "juvenile." Subacute rheumatism was more likely to lead to cardiac involvement because it was more often neglected. Where no special provision was made for rheumatic children not less than 60 per cent. of them developed organic heart disease, and any scheme aiming at the prevention of heart disease must provide for the ascertainment of rheumatic children at an early stage. Probably not more than 10 per cent. of cases under supervision would require hospitalisation at any one time, but supervision of all rheumatic children should be maintained at intervals of three months for the whole of school life. Control of the disease was largely a question of ensuring a correct régime of rest, sleep, diet, and clothing. In selecting suitable cases for hospital, and in assessing the activity of the rheumatic process, estimation of the sedimentation-rate of the red cells was of great value. Summarising the results obtained in the treatment of 598 cases in a special hospital in Cardiff between April, 1929, and June, 1934, Dr. McSweeney said that of 492 children admitted with early carditis 376 had normal hearts on discharge after an average of 10-12 weeks' treatment. The relapse-rate was also less in children who had had hospital treatment.

Dr. W. R. F. COLLIS said that the attitude of the average clinical teacher towards rheumatic fever was apt to be depressing, but Dr. McSweeney's results with cases detected early were exceedingly promising. He deprecated incomplete removal of tonsils, which did more harm than good to rheumatic children.—Dr. KERRY REDDIN complained that little interest was evinced by the children's hospitals in rheumatic children.—Dr. R. E. STEEN described juvenile rheumatism as a disease of malnutrition and faulty hygiene, and said that adequate rest was impossible in the patient's own home.—Dr. DOROTHY PRICE held that rheumatic children could not be properly handled in an out-patient department.—Dr. T. T. O'FARRELL thought the problem was one for parents, school teachers, and public health authorities rather than clinicians.—Dr. E. HARVEY emphasised the need for research into causation.—The PRESIDENT said the detection of 30 rheumatic cases a week in the course of school medical inspection in his area showed how serious was this problem in Dublin. Specific provision was necessary for these cases.

Dr. MCSWEENEY, in reply, said that absolute rest in bed constituted 95 per cent. of the treatment of juvenile rheumatism. Severe cases of chorea become quickly quiescent with no other treatment than absolute immobilisation. A pulse-rate persistently over 90 during sleep in a rheumatic child was suggestive of activity. Relapses sometimes occurred during hospital treatment, but were uncommon.

REVIEWS AND NOTICES OF BOOKS

La tuberculose ostéo-articulaire

Evolution—Diagnostic de début et Traitement.
By Dr. JACQUES CALVÉ (de Berck), with the
collaboration of M. GALLAND and M. MOZER.
Paris: Masson et Cie. 1935. Pp. 208. Fr.50.

TUBERCULOSIS in any part of the body generally calls for prolonged treatment and even more prolonged observation of the patient after discharge from hospital; and this is particularly true when bones and joints are involved. It is therefore to be expected that the best teaching on the treatment of tuberculous joints should come from surgeons who have had many years' experience in a hospital chiefly devoted to the treatment of these conditions. Dr. Jacques Calvé and his splendid hospital at Berck enjoy a reputation extending far beyond the borders of France; this work is therefore sure of an international welcome. It is written for those who are already familiar with the ordinary manifestations of tuberculous joint disease; the absence of text-book descriptions is a refreshing feature in a book which gives an informal presentation of the author's views on the whole subject, with special reference to the three most common sites of infection—the spine, the hip, and the knee. The views of other workers are discussed with frankness and keen insight and in a generous spirit.

The old-fashioned "surgical" conception of a tuberculous joint is shown to be wrong. It is not the case of a tuberculous joint occurring in an otherwise healthy individual, but of a tuberculous patient who happens to have a focus of disease in a joint. Adequate general treatment is the first essential. Under favourable conditions the lesion runs its course with a regularity not unlike that found in scarlet fever or pneumonia, the difference being that the process is very much slower. There is a stage of invasion; then a long battle between the local disease and the body's defences, marked by attack and retreat on one side or the other; in the end the victory generally falls to the patient and repair begins. The profession in this country now recognises that so-called conservative measures are the most important feature in the successful treatment of tuberculous joints; yet there is still an impression that these measures have merely been tried empirically and found to be good. Calvé shows *why* conservative treatment is rational and therefore correct. In the absence of a specific remedy of proven value, the surgeon serves his patient best by placing him in a suitable environment and putting the damaged joint completely at rest until the lesion becomes quiescent. At this stage operative fixation is often of value in stabilising a joint that has been disorganised by disease. There is also an indication for early operation—i.e., when an early tuberculous focus appears in the neighbourhood of a joint. Prompt eradication of the focus may save the joint from involvement. But, generally speaking, operative treatment is no more than an occasional accessory.

On one major point we are inclined to disagree with Dr. Calvé. He does not advocate exploratory arthrotomy in early cases undertaken to settle the diagnosis. In the knee, at any rate, this simple and safe operation will often give the correct diagnosis when the test of function leaves the surgeon in doubt. Biopsy is not infallible but it is the most certain means of diagnosis at present known in doubtful cases of arthritis of the knee and ankle.

The early arthrodesis of every tuberculous joint, as advocated by Hibbs, makes an immediate appeal to everyone familiar with the laborious technique and the constant attention to detail demanded by the conservative régime, and there is a tendency for some surgeons to accept Hibbs's teaching without weighing the possible cons against the alluring pros. The older orthopædic surgeons in this country have learned their lesson, though little has been said by them in the literature. Junior men, impatient of conservatism, should read Calvé's splendid discussion of this problem; it will cause them to make haste slowly.

There are few things in this delightful book that call for adverse comment. The section on differential diagnosis is too short to be of much value and is probably unnecessary; and there is no excuse for printing X rays of the spine upside down—see pp. 78 (Fig. 24—right) and 81.

Post Mortems and Morbid Anatomy

Third edition. By THEODORE SHENNAN, M.D.,
F.R.C.S. Edin., Professor of Pathology in the
University of Aberdeen. London: Edward
Arnold and Co. 1935. Pp. 716. 30s.

THIS book has long been the standard work in English devoted solely to post-mortem technique and morbid appearances. It is essentially a practical work and gives the reader precise and helpful information obviously based on the author's own extensive experience; innumerable hints on minor points which may seem obvious to the morbid anatomist will be of considerable help to the student. For the most part the book is limited to pure morbid anatomy, but morbid histology and general pathology have been included where they are necessary for a proper appreciation or interpretation of the post-mortem findings. This is particularly true of the section on renal disease in which the author has not hesitated to include even the clinical picture.

The new edition retains the general style and lay-out of its predecessors and is arranged as far as possible in the order in which the organs are examined according to the author's technique. A number of sections have been rewritten, in particular those on endocarditis, tubercle, and splenic and renal disease. There have also been several lesser alterations, and new illustrations have been added. The section on disease of the coronary arteries might well have been enlarged, particularly the part describing the appearances of old and recent thromboses. There is a minor printer's error on p. 438.

The new edition, like its predecessors, will certainly prove useful if not indispensable to anyone called upon to perform post-mortems.

Human Pathology

Fourth edition. By HOWARD T. KARSNER, M.D.,
Professor of Pathology, Western Reserve University,
Cleveland, Ohio. London: J. B. Lippincott
Company. 1935. Pp. 1013. 45s.

THE major alterations in this edition have been made in the chapters on tumours, the hæmopoietic system, the endocrine diseases, and the central nervous system. Apart from these, a number of lesser changes appear in the text, and all the important advances

made since the last edition appeared in 1931 are noticed. The new material has been carefully sifted and nothing included which is not likely to find general acceptance. The section on the anæmias is unduly brief and in discussing tubercle insufficient stress is laid on the importance of primary infection. The lists of references also call for criticism in a text-book designed for students. They are very long and unusually complete, but no undergraduate could judge of the relative importance of the papers mentioned without some help.

The book as a whole is remarkably complete without being unduly large and the teaching is sound. The photographs and drawings are well chosen and reproduced.

Infant Behaviour, Genesis and Growth

By ARNOLD GESELL, Ph.D., M.D., Sc.D., Director of the Clinic of Child Development and Professor of Child Hygiene in Yale University; and HELEN THOMPSON, Ph.D., Research Associate in Biometry, the Yale Clinic of Child Development. London: McGraw Hill Publishing Company, Ltd. Pp. 343. 18s.

Dr. Gesell is known for his comprehensive objective studies of infant behaviour. The present volume is based upon his earlier work; it deals with genetic interpretations and methods of investigation, both by cinematographic observation and actual daily tests upon the growing infant. There is scarcely a muscular movement of the human infant from birth to the second year which has not been carefully studied from day to day in order to investigate growth in coördination and the emergence of intelligent social behaviour. The book contains a series of graded estimates of the child's ability to carry out simple operations. Each test situation has been studied with the energy of Hercules.

No student of infancy can be without this important book. It should be of value to all those who are interested in the academic study of infant behaviour and also and particularly to those who find it so difficult to decide whether mental retardation has appeared in the early months of life. We must congratulate the authors in having produced in such an excellent form the results of their far-reaching researches.

An Index of Differential Diagnosis of Main Symptoms

Fifth edition. By Various Writers. Edited by HERBERT FRENCH, C.V.O., C.B.E., M.D. Oxon., F.R.C.P. Lond., Consulting Physician to Guy's Hospital; late Physician to H.M. Household. Bristol: John Wright and Sons Ltd.; London: Simpkin Marshall Ltd. 1936. Pp. 1145. 63s.

THE new edition of this important book reflects great credit on Dr. French and his 18 collaborators. Two new authors, Dr. Bruce Perry and Mr. W. H. Ogilvie take the places of the late Dr. Carey Coombs and Mr. R. P. Rowlands. Dr. Perry has contributed articles on angina pectoris, cardiac bruits, and irregular pulse; Mr. Ogilvie on club-foot, spinal curvature, and inguinal swellings. Descriptions of new diagnostic tests of proved reliability, such as the Aschheim-Zondek, have been introduced and this new edition attempts as before to cover the whole diagnostic field of general medicine, surgery, gynaecology, dermatology, neurology, and ophthalmology. Certain

diseases which have recently become less unfamiliar, such as botulism, abortus fever, Pink disease, and tularæmia, receive attention. The statement, already inaccurate, that the organism of psittacosis is unknown, shows how difficult it is to keep a work of this size up to date. Dr. Hurst's otherwise admirable article on constipation, which should be read alike by doctor and medically minded layman, offers certain points in the differential diagnosis between acute constipation and acute intestinal obstruction, which may not be universally acceptable. He states that "visible and palpable peristalsis is never present except in obstruction," whereas, in fact, it is often to be observed in healthy persons of lean habit. He says, moreover, that vomiting is never fæculent in non-obstructive cases except "at a very late stage," but is not this equally true of obstructive cases? No experienced clinician would wait for fæcal vomiting before diagnosing acute intestinal obstruction. On the other hand, Dr. Hurst wisely emphasises the importance of early diagnosis of absolute constipation, if necessary, by giving two enemata at short intervals.

Dr. French, not only the editor but also the most prolific writer of the book, has himself supplied nearly 150 articles on a great variety of subjects. There are many excellent photographs and coloured plates, those of the fundus oculi illustrating Mr. H. L. Eason's notes on ophthalmoscopic appearances being worthy of special mention.

From a Colonial Governor's Notebook

By SIR REGINALD ST.-JOHNSTON, K.C.M.G. London: Hutchinson and Co. (Publishers), Ltd. 1936. Pp. 285. 12s. 6d.

Sir Reginald St.-Johnston, barrister, doctor, and administrator, has in this book recounted certain of the experiences undergone, and for the most part enjoyed, during 30 years in the Colonial Service. The book does not attempt to be a chronological record of the author's life in the Colonies, but is, as he says himself, "a series of odds and ends taken from my notebooks during the time I was administering the government of several colonies or dependencies." After qualifying in medicine and being called to the Bar from the Middle Temple, Sir Reginald joined the Colonial Service, and for a period held various judicial and administrative appointments in Fiji. The war intervened, and he saw service abroad and subsequently was attached to the War Office for special duty. In 1920 he was appointed acting governor of the Falkland Islands and later, in succession, colonial secretary to the Leeward Islands, administrator of St. Kitt's and Nevis, and governor of the Leeward Islands, from which post he recently retired.

In describing the official and social duties and responsibilities which fell upon him in the various important posts, the author produces an eminently readable book. Previous works from his pen have led us to expect him to display an eye for coloured environment, dramatic instinct, and a faculty of fluent narrative; here the many entertaining stories which he tells show intimate acquaintance with all aspects of life in the West Indies, in high official circles, and in the lowliest native life. The book abounds with thumbnail sketches of well-known personalities and picturesque descriptions of places, with notes on the natural history and the climatic conditions.

THE LANCET

LONDON: SATURDAY, MARCH 21, 1936

ON FEELING SECURE

THE issue of the crisis through which we have been passing this week will be mainly determined by the workings of the group mind. It may be well to consider how far the national and international reactions of the moment which perplex the politician may resemble the individual reactions observed by the psychiatrist and becoming increasingly familiar to the medical profession as a whole. In times of crisis everyone is deeply concerned with the question of security, and seeks by all possible means to regain the state of calm. Calm, both in the individual and in society, is usually regarded as the normal state and crisis as a disturbance coming from without. A little reflection leads to a different conclusion, for most people and most communities are far less stable than they imagine themselves to be. When we are at peace, we dread more than anything the pain of examining our instability; only in time of crisis do we feel impelled to "get something done." The tendency to avoid facing something that is dreaded is familiar to every member of the profession but is the special study of the clinical psychologists. They distinguish two types of fear, objective and subjective, according to whether the source of apprehension is known to the victim or not. A good instance of the latter is fear of the dark: a person attributes ("projects" is the technical term) to his environment terrifying impulses which exist within his own mind without his being aware of them; he is afraid unless he can have the assurance of his senses that his surroundings are not harmful. The same process of projection is at work when a person (or a nation) suddenly selects a particular enemy and attributes his troubles to that enemy. A patient who feels that he is encircled by enemies is a difficult case to handle. By attributing aggression to others he can regard himself as an exceptionally pacific person, but his own aggressive attitude may rouse such fear in others that they adopt counter-measures—and then his delusion is, of course, turned into reality. This much is old knowledge; more recent researches throw some light on the causes of another type of mentality. There are people who "revel in danger." When others are

with good grounds afraid, they feel calm and to their surprise are strangely at ease with themselves; prolonged peace (they call it "inaction") leads to uneasiness, they suffer from "peace-neurosis" which is "cured" by war. Investigation shows that danger is welcomed because, when the source of mental tension is external as in war, the mind is relieved of an internal strain—that of dealing with its own aggressive tendencies.

The nucleus of the whole problem lies in the mode of dealing with aggressive impulses. If these are coupled with a pleasure in constructive activities, the result is productive work; an example of this may be seen in the gigantic undertakings in Russia to-day. If the individual cannot find satisfaction in constructive activity, for instance if he is unemployed or is put to an ungenial occupation, the necessary condition for the binding of the aggressive impulse to cultural ends is lacking, and there is risk of a breakdown of social relations. The political analogy is revolution, if the aggression is kept within the frontiers, or war if the aggression is projected outwards. This is the reason why in the case of an individual faced with an impending crisis it is so important that his energies should to the last moment be given a constructive outlet. Perhaps the same applies to nations. Recent investigations into the psychological problems of neurotic breakdown and of criminality have disclosed a surprising fact—viz., that the projection of aggression outwards is not simply to preserve the illusion that the subject is a thoroughly peaceable person; it also serves in the mind of the subject an unconscious purpose of preserving a loved object or ideal from hostile attack. This is a complicated concept, but it has the support of the clinical observation that the most effective way of maintaining contact with an aggressive or deluded patient is to show an understanding of his ideals and hidden aspirations and a realisation that behind the barrage of his attacks there is also a wish for good relations. An appreciation of his constructive contributions to society, however slight in fact these may be, goes some way to strengthen the forces of cohesion and pacification within the personality. But such measures may fail, and a resort to force may be necessary. Here clinical experience again helps us; the return to sanity is hastened if the patient is not treated as an outcast. The day when the insane were loaded with chains is over; nowadays contact is not lost even though the patient is forcibly restrained.

In a world where unrest and danger abound it sounds a mockery to speak of feeling secure, but a step in that direction is taken when we can recognise our own aggressive impulses and not blindly project them on to others; we then see our neighbours more clearly and do not confuse their intentions with our own, our own with theirs. Objectivity does not give security, but it enables the darkness to be faced without morbid dread.

ACUTE ASEPTIC MENINGITIS

RECENT work suggests that the "acute aseptic meningitis" of WALLGREN and of GÜNTHER is a true clinical entity, and that its cause is a virus isolated by ARMSTRONG. The disease has come into prominence during the last few years, partly because it is mildly epidemic and seems to be getting commoner, and partly because of its importance in the differential diagnosis of tuberculous meningitis. By the bedside it is often impossible to distinguish these two conditions; yet in one the prognosis is excellent, in the other almost hopeless. Since the description of this new disease physicians have come to recognise that every patient with supposed "tuberculous meningitis" has a possible chance of complete recovery, so long as the chloride content of the cerebro-spinal fluid remains above 650 mg. per 100 c.c., and tubercle bacilli have not been demonstrated. This chance is small, but it does nevertheless exist, and no wise practitioner would willingly conceal it from anxious relatives.

The nomenclature of the whole subject is confusing. Many diseases of the nervous system show a lymphocytic meningeal reaction (e.g., tuberculous and syphilitic meningitis, poliomyelitis, encephalitis lethargica, herpes zoster, and the encephalomyelitis of acute exanthemata); so that the recognition of lymphocytes in the cerebro-spinal fluid does not carry us very far. In making a diagnosis of acute aseptic meningitis the following points will be found of value. The patient may be a child or an adult, and the onset is acute, sometimes preceded by a sore-throat. Severe headache is usually the first symptom and this is soon followed by other evidence of meningeal irritation or of increased intracranial pressure: stiffness and pain in the neck, back, abdomen, or limbs; vomiting; photophobia; restlessness and insomnia. Drowsiness, delirium, or stupor are rare; and convulsions uncommon except in infants. Pyrexia is usual; it is often mild, but may perhaps be high at the onset. Constipation or retention of urine may sometimes cause trouble. In the early stages examination reveals little apart from the usual signs of meningeal irritation, the patient lying on one side complaining of severe headache and refusing to be disturbed. Children may appear very ill indeed, and when they are brought to hospital their parents often believe them to be dying. In infants the anterior fontanelle may bulge. Gross papilloedema, pupillary changes, and cranial nerve palsies do not often develop. Kernig's and Brudzinski's signs are usually positive. Early pyramidal signs in the arms, trunk, or legs may perhaps be found, but these are not conspicuous. Lumbar puncture reveals a cerebro-spinal fluid under increased pressure, clear or slightly cloudy, rarely forming a thin clot on standing. Its cells are increased, usually numbering about 100-300, but sometimes as few as 50 and sometimes as many as 3000. At the onset these

cells may be almost entirely polymorphonuclears; in the course of a few days they are replaced by lymphocytes, and by the end of a week there may be lymphocytes alone. Cultures are sterile; no organisms can be seen in stained films, and guinea-pig inoculations give no result. The prognosis is excellent. For a while pyrexia may be continuous or remittent, but between the fourth and fourteenth days the temperature usually falls by lysis. Recovery is then rapid and most patients are able to leave their beds in the third or fourth week of the disease.

In 1934 ARMSTRONG and LILLIE isolated a new filtrable virus, which caused a lymphocytic meningitis in monkeys and mice. They suggested that acute aseptic meningitis was the disease, in man, which most closely resembled that produced experimentally in animals by their virus, and soon it was found that convalescent serum from patients who had had this particular disease protected monkeys and mice from the effects of the virus. In other laboratories similar strains of virus were isolated, both from patients and from mice, and ARMSTRONG was able to prove that these different types were pathologically and immunologically identical. All this work was done in America, but its continuation in this country is recorded in our present issue where Drs. FUNDLAY, ALCOCK, and STERN report the isolation of viruses, resembling ARMSTRONG'S, from two cases of lymphocytic meningitis of obscure clinical type. The blood-serum of both patients contained antibodies which protected animals, not only against these two viruses, but also against the American strain and against one found in apparently healthy English mice. In brief, it seems justifiable from the evidence now before us to conclude that there is a virus living in some strains of healthy mice, on both sides of the Atlantic, which is capable of producing severe neurological disease in other mice, in monkeys, guinea-pigs, and rats; and that this virus can be isolated from the cerebro-spinal fluid of human patients suffering not only from the well-recognised clinical entity "acute aseptic meningitis," but also from another, more obscure, pyrexial nervous disease. This relation of human illness to virus infection in mice will not escape notice and may prove important. At least we may be sure that the work so far done will be the basis of much further study of the nervous diseases of virus aetiology.

ROYAL MEDICAL BENEVOLENT FUND

THE annual meeting of the Royal Medical Benevolent Fund, to be held on Tuesday next, is a centenary occasion, and its significance should not be lost on us. The Fund represents an organised attempt carried on through 100 years to minister to the needs of the less fortunate of the medical profession through the subscriptions and donations of members of their own calling who are better endowed with worldly possessions. That sounds fine, but as we have had occasion to remark almost annually, the circumstances are not such as to

afford reason for much complacency. For although the Fund has had a long life, and although the energy of the authorities of the Fund has been unremitting and excellently directed, the response of the medical profession has not been proportional; it does not point to a recognition of a general responsibility among us towards our more needy brethren, although the evidence of those needs is convincing and tragic.

Now, on a more cheerful note. There will have been observed by all who consider the well-being of the whole profession—which ought to mean every man and woman whose name is on the Medical Register—that the Fund has lately taken a greater hold on the attention of practitioners. For the last three years, when reviewing the annual report, we have been able to announce a stronger condition of the Fund and the report for the year ending Dec. 31st, 1934, showed real progress in an increase of income, an increase in the number of annual subscribers, and an increase in small donations to the special Christmas Fund. Annual progress of this sort is highly satisfactory, and will have given great encouragement to the authorities of the Fund; none the less if the progress were maintained at the same rate it would still take some 50 years before the aggregate benevolence of the medical profession towards its less fortunate members would reach the annual sum needed to deal with the sad cases which come before the Fund for assistance. The stories published by the committee of the Fund from time to time in the columns of the *British Medical Journal* and *The Lancet* show that there exist among us a number of practitioners who in their old age, through broken health or ill fortune, find themselves in the saddest of circumstances with no one to whom they can appeal for help. The Fund also extends help to widows of medical men and daughters who in later years find themselves without means of support, and these cases are among the most poignant. Further the grants are not made on any surface aspect of the requests for help; all cases are investigated carefully to ensure they represent genuine distress before a grant is made, and anxious care is taken that the necessary precautions against abuse should be conducted with sympathy and delicacy—not an easy task but one that is rendered easier because undertaken by persons with full knowledge. Annuities are given only in the circumstances where there is no possibility of affairs mending, and the highest annuity which can be given at present is £40 per annum, which often does not meet the real seriousness of the position. But the deep gratitude expressed by the beneficiaries, not only for such substantial support but also for the slight augmentations received from the sharing up of the Christmas Fund and the material donations from the associated Guild, combine to prove the status of deep poverty on which many of our brethren are compelled to exist.

The centenary occasion affords a poignant opportunity for the setting right of this position, and it is to be sincerely hoped that the whole

profession may recognise this and rally to the support of the Fund. Next Tuesday comes the statutory annual meeting, but there will be in April a general appeal to the profession setting out the claims of the Fund to larger and more general response. The appeal will have behind it the long history of a charity greatly needed and admirably administered. None should fail to see its force, and, incidentally, no one need delay until April before giving support.

TREATMENT BY PROLONGED NARCOSIS

THE psychiatric use of prolonged narcosis has lately had a wider vogue in this country because of the Cardiff work on insulin as a protective against poisoning by the narcotics employed. Dr. PARFITT's paper in our issue of Feb. 22nd must be read, however, as a warning against too easy confidence in such precautions. His series of carefully treated patients showed alarming toxic symptoms, which were as common in those who received insulin as in those who had only glucose in addition to the narcotic somnifen, and 3 of his 56 patients died. So risky a method of treatment is plainly unsuitable for general application, unless the advantages can be clearly demonstrated.

The situation is in some respects parallel to that arising when malaria was introduced into the treatment of general paralysis. Widely different in efficacy, the two methods have this in common, that there is no precaution, no routine procedure in their administration which can take the place of special experience in their use, or good clinical judgment in selecting cases and supervising the course of the therapy. This may well be seen in the various publications from Burghölzli, the clinic in which the method was first employed by KLAESI. In the first year, 1920, three patients died. From then till 1927, when OBERHOLSER published the experience of the clinic, there was not a single death among the large number of cases treated. Variations in the technique were tried, and in 1929 all oral ingestion was stopped during the 10-14 days of the treatment; fluids being given by the rectum instead. Dial, Luminal, and other narcotics were urged besides somnifen, and LUTZ reported the rather satisfactory results. Then, in 1930 a mixture suggested by CLOETTA, who had been responsible for the original proposal to KLAESI in 1920, was introduced, and the outcome has been gratifying.¹ The precautions taken by the very experienced physicians and nurses of the hospital have been exceptionally detailed; to read of the many points to which they have learnt to direct their attention is to recognise the need for expert handling of the method if its risks are to be minimised and its best effects secured. Yet even in these accomplished hands there have been mishaps. Of 125 narcoses, carried out on 84 schizophrenic patients between 1930 and 1934, two ended fatally, and others caused much concern.

¹ Cloetta, M., and Maier, H. W.: *Zeits. f. d. ges. Neurol. u. Psych.*, 1934, cl., 146.

In appraising these results, however, it must be borne in mind that the method was more thorough and drastic than that usually employed in England. In a mitigated form, continuous narcosis can in careful hands be employed extensively and safely. Dr. P. K. McCOWAN, who states that at Cardiff City Mental Hospital it is rarely found necessary to give more than 4.0 c.cm. in the 24 hours, reports in our issue of Feb. 29th (p. 508) that 154 cases have been treated without a single fatality, and in an English psychiatric clinic it has been much and profitably used for eight years, likewise without a death. The value of the method can best be estimated by noting the number of hours of

sleep obtained with the drugs over a fixed period, and the outcome in adequate numbers of patients with particular varieties of mental illness and of well-investigated prognosis. The recent paper of MONNIER,² also from Burghölzli, is excellent in this regard, as also for the discussion of precautions, mechanism of improvement, and course of the narcosis. It might with some reason be urged that no one should undertake this sometimes dangerous method of treatment, with or without insulin, until he had familiarised himself with the exceptional knowledge of the physicians at Burghölzli, available in their publications.

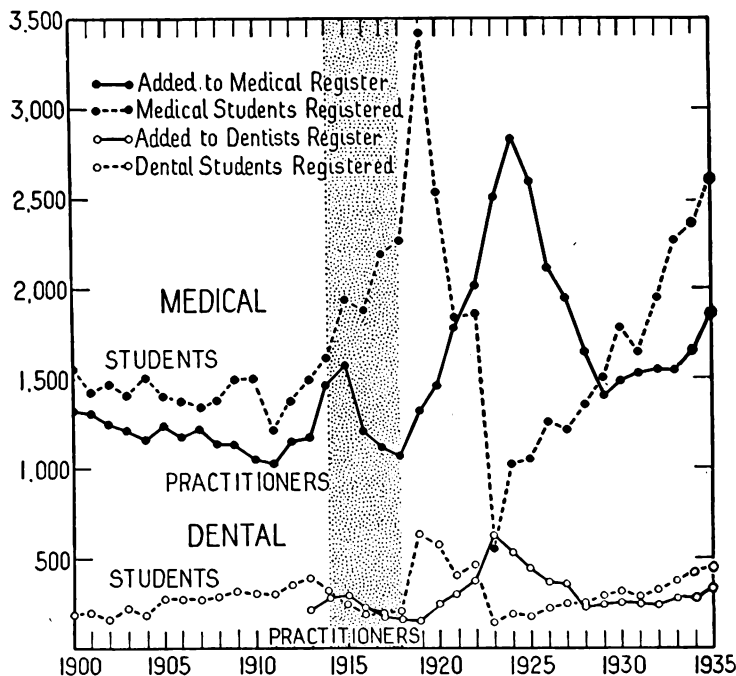
² Monnier, M.: *Nervenarzt*, November, 1935.

ANNOTATIONS

THE PORTAL OF MEDICINE

THE three volumes¹ sent us at this time of year by the Registrar of the General Medical Council always contain food for thought. Last year we remarked that the number of new qualifications had risen steadily since 1929 and was 40 per cent. above the entry which seemed to meet requirements in pre-war days. The figure was then 1664. It is now 1884; and since there is also an increase in the number of medical students registered—last year 2350, this year 2603—on which turns the number of qualifications after a 5-6 year interval, evidently the engorgement of the medical profession is continuing and indeed increasing. In May last as we anticipated the position was considered by the General Medical Council, when Sir Norman Walker recited the figures and commented upon them. "I recall," he said, "our past experience that, when trade is bad, entries of medical students go up, and vice versa. There are schools which are conscious of the fact that their equipment and staff are being severely strained, and that they must consider limitation of entry. But there is a general feeling of hope in the air to-day, and perhaps the severe limitations under consideration in some places may not be necessary. There will not, I feel sure, be any tendency to lower the standard of entry even if numbers do go down a little." But if the analogy from past experience still held, there should have been a diminution in the number of students entering last year, at all events in the latter half, for by that time the trough of trade

¹ The Medical Register for 1936 (21s.); the Medical and Dental Students Register for 1935 (7s. 6d.); the Dentists Register for 1935 (12s.); all published for the General Medical Council by Constable and Co., Ltd.



depression was already a year or more in the past. It may be that the lag is longer than this and that the prospect of better commercial openings may only now be beginning to divert school-leavers away from medicine. It is clear enough that the suggested limitations of entry to medical schools cannot generally have been put into force, although everywhere the raised standard has been maintained.

In one respect the entry is still abnormal. For several years past the number of medical students gaining access to the students' register by virtue of study abroad has been well over a hundred, the influx being preponderantly from German universities. In 1935 111 of the 122 names so registered implied German origin and, with slight exception, they are the names of men and women—for many of them are women—who began their medical study ten, twenty, or even more years ago, and may be presumed to have already practised medicine in the country of their origin. Very few continental refugees, if the students' list can be taken as a guide, are studying medicine from the outset at English or Scottish schools. The influx of unfortunate refugee practitioners seeking registration here can hardly continue long. Many who resent

or fear their competition in medical practice might have less reason to object to a foreign element in dental study where the number of entries, though rising, is still quite insufficient to cover the death or retirement of the immense group of middle-aged dentists admitted under the Dentists Act of 1921. The increment of 14 dental students in 1935 is entirely covered by the 24 who came from Germany. Turning to the additions to the Medical Register itself it may be

noted that there is an increase in every section; the surplus of 220 over last year's increase is made up of registrations in England 124, Scotland 38, Ireland 23, Colonial 23, Foreign 12. It is many years since as many as 19 names have been added in a single year to the Foreign section of the Register; they are all admitted on Italian qualifications although in only 6 cases has the name an Italian sound.

This and much more of the trend of medical polity can be gleaned from these three volumes which contain, as always, that recital of the Medical and Dentists Acts which should be studied as closely by those within the profession as they are by those without. The graphic picture has been again brought up to date and may spare a number of words in setting out the situation.

PHYSICAL MANIFESTATIONS OF EMOTION

THE changes in the body which accompany emotion have not yet been fully explored. The cruder manifestations of anger and fear, which all may witness and experience, were illuminated by the researches of W. B. Cannon and the part played by the vegetative nervous system and the suprarenals in producing these familiar outward signs of emotion is now established. But it is doubtful whether in their daily practice doctors give sufficient regard to the physical phenomena that can be laid to the door of an emotional disturbance. It would be unjust to conclude that this neglect of the psychogenic is the outcome of faulty habits of thinking about disease or faulty teaching. It is in large measure due to the vagueness of these psychosomatic relations, the lack of precise information as to the more restricted changes which may occur within one or other bodily system, and the way in which "emotion" is talked of in the round, whereas it is particular emotions, with their specific psychic quality and causation, that have clinical significance. As long as it seemed that diarrhoea, for example, might be a manifestation of fear, that constipation might also be attributable to this affect, and that either might be due to other affects as well, the adequacy of simple psychogenic explanations for such a disorder as diarrhoea remained suspect. Doubtless also the difficulty of distinguishing between the common, quasi-universal manifestations of affect and the personal individual ones has been a stumbling-block. The psychiatrist, however, is continually impressed by the frequency with which functional and even plain structural changes in the body can be traced back to emotional upsets, sometimes transient, sometimes lasting. In his concern for individual experiences, and psychological causes, he may sometimes, indeed, overlook the importance of the physiological happenings which are, more or less inevitably, set going by an affective happening to such effect that they become independent of their origin and proceed according to their own laws of succession. It is clearly profitable for all physicians, whether psychiatrists or not, to have at their disposal a comprehensive survey of what is known concerning the influence of emotions on the functions of the various organs of the body. A monograph has lately been written by Dr. Erich Wittkower,¹ which covers the literature of the subject and describes his own researches, carried on for several years in the medical clinic of the Charité in Berlin and latterly in the central pathological laboratory at the Maudsley

Hospital. So diligently has this author studied the work of others that his bibliography is gargantuan; and his own investigations have covered a very wide field. The respiratory and circulatory systems, salivary and biliary secretion, the stomach, the blood, the urine, and the thyroid gland are reported on in detail, as is also the psychogalvanic reflex. Dr. Wittkower indicates the significance of the relationships discussed for any interpretation of the findings in internal medicine as well as in the neuroses; though in his excursion into the latter field he is sometimes guilty of over-simplification of the problems. However, the monograph is not designed only for psychiatrists; it provides a detailed conspectus whereby physicians as a whole may make themselves acquainted with the large, though still inadequate, body of knowledge embedded in a polyglot multitude of publications.

MYCOSIS FUNGOIDES

VYING with pemphigus in its malignancy, and equally intractable and uncertain in its reactions to all forms of treatment, mycosis fungoides, in spite of the immense amount of work that has been lavished upon it, remains an unsolved problem. Fortunately like pemphigus it is an exceedingly rare disease, and even the large skin clinics do not see more than one or two cases in as many years. It owes its name to Alibert, who first described it in 1814, long before the term "mycosis" had assumed the significance it holds to-day. As far as we know the symptoms are not due to a mycotic or fungous infection, and the second appellation also is adjectival only, and descriptive of the fungating character of the third and usually terminal stage of the disease. Of the published cases 75 per cent. have occurred in men in the fourth decade of life, and very few of these have survived the fifth. The first or premycotic stage may resemble an eczema or psoriasis so closely that the most experienced are commonly misled. It may last for years with intensely pruritic patches, which nothing but X ray treatment will relieve. This feature should tend to arouse our suspicions of the underlying cause of the symptoms, which may be further enlightened by microscopic examination of the sections. In the second, or stage of infiltration, there is a cushion-like soft elevation of the patches, which become rather more sharply outlined, and as they spread outwards in a circular or gyrate fashion tend to coalesce. In so doing they demarcate or surround residual islets of healthy skin, which are thus roughly angular in outline and highly characteristic in the clinical picture. The third stage is that of ulceration of the extending patches of infiltration, which often reach the size and conformation of tumours. These are always soft and the term "tomato" describes them with some accuracy. They are usually exceedingly sensitive to quite small doses of X rays ($\frac{1}{4}$ - $\frac{1}{2}$ S.B. dose). Only one or two should be treated at a sitting for fear of undesirable effects from too rapid absorption of toxic substances. Hitherto X rays have been the only reliable weapon in treatment, and even these fail eventually in the large majority of cases to do more than postpone the inevitable exhaustion from ulceration and secondary sepsis. As in several other dermatoses improvement has sometimes been observed to follow pyrexia both accidental and artificially induced, and Dr. H. MacCormac now reports a case¹ in which the method of malarial therapy, as for G.P.I., was twice

¹ Jour. of Ment. Sci., 1935, lxxxii., 533.

¹ Proc. Roy. Soc. Med., vol. xxix., February, 1936, p. 238.

successful after all other measures had failed. The author confidently asserts that "without this treatment he would have died." The improvement was certainly sustained from May, 1934, when he was demonstrated to the dermatological section of the Royal Society of Medicine, to the present day. It is of course much too soon to claim a cure, but the method is accessible nowadays in any large hospital, by courtesy of the Ministry of Health, and is well worthy of further trial. It may not be out of place to remind our readers that most diagnosed cases of mycosis fungoides have already been subjected to prolonged or frequently repeated X ray treatment, as a result of which they may have developed anæmia and leucopenia of variable degrees. Due consideration of the differential blood count should therefore always precede the malarial inoculation.

THE TREND OF POPULATION

IN the course of three public lectures lately given in the statistical department of University College, London, Dr. R. Kuczynski, well known to students of vital statistics for his extensive work on population problems, spoke of the past and possible future trend of population growth in different parts of the world and the close bearing this trend has on the economic problems of the day. Over the past century and a half he finds that the white population of the world has increased at an average rate of nearly 1 per cent. per annum. This increase has been due to the decline in mortality following on advance in the standard of living and in the art and science of medicine. Such factors have led to nearly a doubling of the expectation of life at birth in the countries of western and northern Europe. This extension of the average duration of life is, however, as is generally recognised, due largely to the vast improvement during the twentieth century in the infant mortality-rate and in the ages of childhood and young adult life. At more advanced ages, 60 years and over, there has been relatively little improvement, as is shown in the new English life table on p. 686, and it is possible that we are just as incapable of extending life at these ages as were our forefathers. Kuczynski takes the view, therefore, that future population trends will depend mainly upon fertility and not, as in the past, upon changing mortality. Whether fecundity—that is, reproductive power—has changed in the course of years is a controversial question. There is no evidence, except for France, that fertility in marriage was lower until the middle of the nineteenth century than in former centuries, and the decline of fertility in recent years is in Kuczynski's opinion almost certainly due to the deliberate restriction of births. The best measure of the present rate of growth he takes to be the net reproduction-rate—the number of future mothers derived from present mothers. By that measure all countries of western and northern Europe, the United States, Australia, and New Zealand are failing to reproduce themselves. At present rates in western and northern Europe 100 women give birth to only 76 future mothers. The population of England and Wales will probably increase for another seven years and then decline, with an increasing proportion of persons in the older age-groups. In 1881, persons of 60 years or more formed only 7 per cent. of the total population; in 1931 they comprised 11 per cent.; and by 1981, if the present trend continues, they will have risen to 22 per cent. Very little improvement in the reproduction-rate could be derived from an improvement of the mortality-rate

of women in the childbearing ages, or in a higher marriage-rate, or in an earlier age of marriage than at present. Increased fertility can only be brought about, Kuczynski believes, by less birth control. Better economic conditions would not necessarily achieve this, for fertility began to fall while the standard of living in this country was still rising, and the economic incentives applied in Italy appear to have been a complete failure. It is too early to say yet whether action in Germany is likely to be effective, but she is relying rather upon the inculcation of new ideas than upon economic advantages. A general desire for more children seems to be the only hope of increasing fertility, and it hardly appears likely, with the world in its present state of instability, that that desire is going to develop. In addition the general attitude on questions of population has radically changed. Twenty-five years ago the prospect of a decreasing population in this country would have been viewed with alarm; now, with widespread unemployment, we are far more afraid of over-population. Whether those fears are justified Kuczynski is more than doubtful. Under-population, by limiting consumption and economic development, may possibly be as powerful a cause of unemployment as over-population. It may well appear that Mr. Smith the builder is better off by having only one child, but he is only better off so long as other people have, say, three, and therefore create a demand for his services.

There is no doubt, as Lord Dawson pointed out in introducing Dr. Kuczynski, that these problems of the growth of peoples are closely linked with all the social and economic questions of the day, and the lecturer gave his audience much to think about.

TREATMENT OF PERIPHERAL ARTERIAL OBSTRUCTION

METHODS for the passive exercising of blood-vessels in a limb which is the site of arterial obstruction, for example, contrast baths, have been in use for a long time. More recently an apparatus for alternately increasing and reducing the air pressure on the limb has been used with the same object and strong claims have been made in its favour. Some of these claims are critically reviewed by E. V. Allen and G. E. Brown¹ who are well known for their work on arterial disease. It is admitted that alternate pressure and suction (sometimes referred to as "pavæx," signifying passive vascular exercise) is able to increase the blood flow in a limb, both when normal and when the seat of some vascular obstruction, since this procedure causes a definite increase in skin temperature, which may last up to 72 hours. However, though there is no evidence that the blood flow can be increased permanently by this means, a transient increase repeated frequently might be expected to relieve symptoms. Published reports indeed suggest that with this treatment indolent ulcers may heal, rest pain may be relieved for variable periods, intermittent claudication is usually benefited, while gangrene can be avoided in cases of sudden arterial occlusion if the treatment is begun early enough. From their experience of 60 cases the authors are able to confirm these results only in part; they found more benefit in the pain of ischæmic neuritis than in the pain accompanying trophic lesions, while in one case of sudden arterial occlusion gangrene developed in spite of treatment begun within a few hours; the pain was, however, relieved. In intermittent claudication no improvement was

¹ Jour. Amer. Med. Assoc., 1935, cv., 2029.

noted. The conclusion drawn from the total results is that though passive vascular exercise has its uses in arterial disease it has yet to be shown that its value, except perhaps in ischaemic neuritis, is greater than that of other conservative measures. It may also be a suitable method in older patients for whom protein shock and sympathectomy might be considered inadvisable.

CHANGES IN THE BREAST DURING THE MENSTRUAL CYCLE

Dr. Howard C. Taylor,¹ of New York, has made a serious effort to determine how far the clinical changes in the breast associated with menstruation are related to histological changes. The views hitherto expressed are notoriously conflicting, some observers having reported what almost amounts to a complete reconstruction of the glandular elements of the breast with each menstrual period and their disappearance in the intervals, while others deny the evidence for epithelial proliferation and retrogression. It may be recalled that three years ago in our own columns Dr. Helen Ingleby² described cyclical histological changes as occurring, not only in normal breast tissue, but in tumours of the breast. Thus she regarded fibro-adenomata as owing their development to local interference with the normal process of intermenstrual involution. Cystic mastitis was in her view the result of irregularity in the cyclical changes in the breast, while the variations in histological appearances of carcinoma depended on the degree to which the cells of the lobules had undergone a malignant change whereby they lost their power of postmenstrual involution.

The difficulty of obtaining normal material is at once evident—particularly material from cases in which a reliable menstrual history is available. Taylor makes his observations on tissues from four sources: (1) apparently normal parts of breasts of 41 patients operated on for disease processes in other parts; (2) breasts, or parts of breasts, removed because of pain at the periods; (3) a few hypertrophied breasts which were available for histological study; and (4) gross sections and histological examinations made in a few cases of secretion from the nipple. His first conclusion is that "normal" breast tissue shows much variability of the glandular elements without relation to the stages of the menstrual cycle, and that no epithelial proliferation typical of any stage can be recognised. In one patient portions were removed from identical parts of the two breasts, one section being made 14 days after the last period, and the other on the day that menstruation began; yet there was no detectable difference in the degree of acinar development, although the case was one in which a painful hypertrophy of the breasts occurred at each menstrual period. The most constant findings recorded are cyclical intracellular changes, leading to blurring of the cell outlines; and oedema of the interlobular connective tissue, due to premenstrual hyperaemia and leading to sharper definition of the lobules. Taylor believes that those observers who have described a definite epithelial proliferation in the premenstrual period have formed their opinion without sufficient regard for the normal variations, and in particular for the age variations, of the material examined. Painful breasts may or may not show diffuse areas of induration. Even with a fairly well-marked nodularity, histological examination may show little to distinguish

the section from normal breast tissue. Oedema or a slight localised hypertrophy must here account for the signs and symptoms. Increased density of the connective tissue does occur in some cases, and may be associated with an actual diminution in the size of the lobules. The findings in the painful hypertrophies were much the same. Some showed a normal histology; in others there was an increase in fibrous tissue. Signs of epithelial proliferation and of cystic formation were uncommon; areas containing "disappearing lumps" were found to differ little from the normal. The cases of discharge from the nipple did, however, show definite changes in the glandular elements. The ducts were widely dilated, and were filled with amorphous material; the acini were more numerous, and the duct epithelium might appear active, even filling the lumen in places, or forming papillomata. Evidence of catarrhal inflammation and fibrosis was sometimes found in these cases. Secretory activity seemed to bear no relation to the menstrual cycle. Non-puerperal lactation is, of course, distinct from the type of discharge associated with duct changes; but chances to study this condition histologically are uncommon.

MORE RADIUM WANTED

THE sixth annual report¹ of the National Radium Commission expresses a belief that at least another 20 grammes of radium could be used to reinforce the routine work of existing centres throughout the country and to provide larger units for special work. The recommendation may come as a surprise to careful readers of earlier reports who will have noticed the guarded tone which the Commission has adopted towards the use to which the national supply of radium has been put at certain centres and particularly towards the larger units of radium element. The long delay in the issue of this report can hardly be attributed solely to the eviction of the Commission from its pleasant offices in the Adelphi and may be associated with the need for unanimity felt by the Commission before issuing so important a recommendation. It is not long since many of those who know most about the properties of radium were still feeling that some of it might have been left more safely on the Belgian slag heaps than distributed where the knowledge and responsibility for its clinical use were still imperfectly developed. The delay will have enabled the five new members of the Commission—Dr. Thos. Carnwath, Dr. T. Ferguson, Dr. Robert Hallam, Prof. J. C. G. Ledingham, F.R.S., and Prof. James Young—to take their share in the decision. Reports from national radium centres this time contain much reason for contentment. Whole-time radiologists and physicists have been appointed, follow-up departments have been so active that almost every patient treated has been traced, reorganisations have been carried out, and generally the Commission's policy of centralisation, coöperation, and documentation has been realised. In the words of the report, "the national centres provide evidence of a determined effort on the part of the authorities concerned to fall in with the Commission's ideal of a national scheme," and although the number of regional centres has not been increased, four hospitals with radium departments have been recognised by the Commission. In fact just as the centres are actually becoming progressive, and just as the Commission is drawing upon the last available supplies, it

¹ Surg., Gyn., and Obst., Feb. 1st, 1936, p. 129.

² THE LANCET, 1932, ii., 835.

¹ Sixth Annual Report of the National Radium Trust and Radium Commission, 1934-1935. Cmd. 5112. H.M. Stationery Office. 9d.

is being asked for larger and larger quantities of radium. Turning to the use of larger units the report states that the work of the three 1-gramme units has proceeded without interruption, while the standing clinical committee has reported that this form of treatment is of definite value. There is only one 5-gramme unit known to be in use at the moment in Great Britain. The investigation of beam therapy is being followed by the Trust "with great interest." So far it has been limited to carcinoma of the head and neck, but with results sufficiently promising to justify the continuance of the investigations. This is in brief the background set out in the report to justify the Commission's desire for more radium. The public has never been backward in providing more when called upon to do so and no doubt it will be forthcoming.

THE PRICE OF MILK FOR HOSPITALS

In the House of Commons on Feb. 17th Mr. Thomas Johnston complained that the policy of the Government, by raising the price of milk supplied to hospitals, clinics, and poor-law institutions, was increasing their already serious difficulties. He asked the Minister of Agriculture to restore the price to that charged before the inauguration of the milk marketing schemes. In Glasgow the local authorities and voluntary hospitals have been agitating for two years for cheaper bulk supplies of milk from the Scottish Milk Marketing Board. They have shown that the city corporation is now paying £13,000 a year more than before the scheme come into force, while a voluntary hospital such as the Royal Infirmary is paying an extra £1500. Last week a committee of the corporation met to consider a letter received from Sir Godfrey Collins, Secretary of State for Scotland, who wrote that he would not be justified in asking the Milk Board to reduce the price to hospitals merely on the ground that this price had been raised by the elimination of price-cutting competition. The Board, however, would be prepared to agree to a 50 per cent. reduction in the price of any milk bought by hospitals in excess of last year's supplies. The corporation's committee expressed dissatisfaction with this reply, maintaining that the offer of a lower price conditional on increased purchases is of little value because the patients are already getting as much milk as they can consume. They decided to ask the Secretary for Scotland not to make a final decision until the report of the Reorganisation Commission on Milk Marketing has been issued.

Lord Willington, the retiring Viceroy of India, has been selected to be chairman of the St. George's Hospital rebuilding fund.

THE death is announced from Washington of Dr. William Holland Wilmer, the prominent American ophthalmologist, director of the Wilmer Ophthalmological Institute.

ON Tuesday and Thursday, March 24th and 26th, at 5 P.M., Mr. Joseph Needham, Sc.D., will deliver the Oliver-Sharpey lectures to the Royal College of Physicians of London. He will speak on chemical aspects of morphogenetic determination.

WE regret to announce the death of Sir Kedarnath Das, of Calcutta, principal of the Carmichael College and author of "The Obstetric Forceps" and other well-known works on midwifery and gynaecology.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surgeon Rear-Admiral Bryan Pickering Pick, O.B.E., has been appointed Honorary Surgeon to the King from Jan. 16th, 1936.

Surg. Comdrs. F. L. H. MacDowel to *Excellent*; K. A. J. Mackenzie to *Drake* for R.N. Hosp., Plymouth; and J. C. Souter to *Pembroke* for R.N.B.

Surg. Comdr. G. S. Harvey placed on the Retd. List at own request with rank of Surg. Capt.

Surg. Lt.-Comdr. H. J. McCann to *Pegasus*.

Entered as Surg. Lts. (D.) for Short Service: A. F. Ferguson, J. B. Morris, H. P. L. Rhodes, and D. N. Williamson.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt. W. D. M. Millar promoted to Surg. Lt.-Comdr. Surg. Lt. R. Cormack to *Royal Sovereign*.

ROYAL ARMY MEDICAL CORPS

Maj. P. A. Stewart retires on ret. pay.

ARMY DENTAL CORPS

Capt. I. A. Barlow to be Maj.

TERRITORIAL ARMY RESERVE OF OFFICERS

Maj. H. H. Fowler, from Active List, to be Maj.

ROYAL AIR FORCE

Squadron Leaders H. W. Corner to R.A.F. Depot, Uxbridge, and V. S. Ewing to No. 9 Flying Training School, Thornaby, for duty as medical officers.

Flight Lt. G. S. Strachan is promoted to the rank of Squadron Leader.

Flight Lts. W. G. S. Roberts to R.A.F. General Hospital, Hinaidi, Iraq, and J. A. Kersley to Princess Mary's R.A.F. Hospital, Halton.

Flying Offrs. D. S. M. MacArthur to No. 10 Flying Training School, Tern Hill; C. F. R. Briggs to Home Aircraft Depot, Henlow; L. M. Crooks to Princess Mary's R.A.F. Hospital, Halton; D. J. Sheehan to Central Flying School, Upavon; H. D. Conway to No. 1 Flying Training School, Leuchars; W. J. Fowler to No. 2 Flying Training School, Digby; R. F. Wynroe to No. 5 Flying Training School, Sealand; E. B. Harvey to No. 7 Flying Training School, Peterborough; and I. K. Mackenzie to No. 9 Flying Training School, Thornaby.

Dental Branch.—Flying Offrs. R. M. Brown to Headquarters, R.A.F., Cranwell, and W. E. Nelson to Air Armament School, Eastchurch.

INDIAN MEDICAL SERVICE

Lt.-Col. W. E. R. Williams, O.B.E., to be Col.

The promotion to the rank of Maj. of the under-mentioned officers is confirmed: M. S. Gupta, R. Linton, and H. W. Mulligan.

Lt.-Col. J. Scott, D.S.O., O.B.E., I.M.S., has vacated the appt. of Surg. to H.E. the C.-in-C.

The undermentioned appts. have been made:—

Surg. to H.E. the C.-in-C.: Maj. E. P. N. Creagh, R.A.M.C.

A.D.M.S.: Col. W. J. Powell, C.I.E., Col. S. G. S. Houghton, C.I.E., O.B.E., and Col. D. C. V. Fitzgerald, M.C.

D.A.D.H.: Lt.-Col. J. C. Chukerbuti.

IN deference to the King's wish that public functions connected with the sciences and the arts should not be cancelled, it has been decided that the biennial dinner of the Royal Society of Medicine shall be held at the May Fair Hotel on Wednesday, May 6th, at 7.30 for 8 P.M. Sir Kingsley Wood and Mr. Philip Guedalla will be among the guests.

PROGNOSIS

A Series of Signed Articles contributed by invitation

XCIII.—PROGNOSIS IN MEASLES

MEASLES is the biennial "scourge inexorable" of small children in great cities. The causal agent of the symptom-complex so graphically described by Sydenham and so familiar to every mother that it is apt to breed contempt is generally considered to be a filtrable virus. It is, however, not the virus, although this prepares the way, but the associated bacterial infections of the upper respiratory tract which makes measles one of the lethal diseases of early childhood. In recent epidemics in London these organisms have been chiefly strains of the hæmolytic streptococcus; much less usually, pneumococci and the *H. influenzae* of Pfeiffer have been recovered from swabbings of the nasopharynx of measles patients admitted to hospital. Means of protection of the child population by active immunisation are yet to seek. P. Stocks has shown that some children acquire, during an epidemic, without overt clinical attack, a measure of latent active immunity which may tide them over until the next visitation; in a few the immunity so attained would appear to be permanent. Although a number of cases of measles in the new-born infant infected by the mother are on record, temporary passive immunity, transmitted through the placenta, is the prerogative of nearly all infants at birth. It lasts in full force for the first three months and then gradually wanes. By means of the injection of convalescent or adult immune serum, temporary protection may also be afforded at any age. With few exceptions, solid active immunity is only to be purchased at the price of a clinical attack the severity of which, it is true, may be mitigated by the injection of human immune serum. Serum-attenuation apart, the age of the child at the time of attack, its nutrition and environment before and during the illness, and the season of the year at which this takes place are factors of the utmost importance in prognosis.

Age

For the reason already stated, infants under 3 months of age, however intimately exposed, generally escape attack. The waning of maternally transmitted immunity is to be observed in the attenuated attacks which may occur from the third up to the sixth or seventh month. By the eighth month the infant is at full risk not only from the virus of measles, but, of course, from his constant enemy broncho-pneumonia reinforced by the virus. The toll of life from this complication of measles is greatest during the first two years; the fatality-rate then falls with each succeeding year of age and among children over 5 is small. During the 1933-34 epidemic the fatality-rate at all ages of 12,730 patients admitted to the measles wards of the fever hospitals of the London County Council was 5.1 per cent.

Nutrition.—Environment.—Season

Both the severity of the attack and the likelihood of complications are enhanced among children whose diet has been deficient in vitamins. The prognosis of active rickets, measles, and broncho-pneumonia in conjunction is, to say the least, not very hopeful. The addition of extra vitamins A and D to the diet during the attack is, however, as Dr. Helen Mackay showed in the wards of this hospital, without effect.

Hardly separable from nutrition is environment; the two so often go hand in hand. Halliday showed that in the crowded tenements of Glasgow the maximum incidence of measles fell upon children under school age; in working and middle-class households upon those between 5 and 10 years; and among the public school class at still later ages. When it is added that he estimated the fatality-rate at ages up to 2 years at from 10 to 20 times greater than that which obtained between the fifth and tenth year, the influence of environment upon prognosis is obvious. The older age at which the public school class, due to a sheltered childhood, is attacked may not be an unmixed blessing. A. I. Simey, when at Rugby, preferred outbreaks of measles little and often rather than extensive epidemics which occurred at longer intervals, and strained the sanatorium accommodation.

Epidemics of measles ordinarily commence in October or November, the maximum prevalence being attained during the first quarter of the new year. A late start and therefore a climax reached when seasonal conditions are less favourable to the occurrence of broncho-pneumonia must clearly tend to a reduction in the incidence of this complication and therefore the number of deaths.

Clinical Factors

Epidemics of measles, *qua* measles, like those of other specific infections, vary in severity. Toxic cases may be few or many in individual outbreaks, but death purely from toxæmia is uncommon. On the whole, the belief of the old nurses that a brilliant and profuse rash is of favourable import is justified. The dusky, velvety, maculo-papular eruption, which may be relatively sparse, is of bad omen, whilst true hæmorrhagic measles with bleeding from mucous membranes, now rarely encountered, is almost invariably fatal. Pyrexia in measles starts with the onset of the catarrhal stage and persists until the rash begins to fade. A temperature of 104° F. or more during the eruptive stage is not inconsistent with an uncomplicated attack especially if the rash is robust. But should the temperature not fall with the fading of the rash or should it again rise appreciably after an interval of hours or days, the coexistence or development of one of the major complications must be suspected. The common ones, each due to an extension of the concomitant bacterial infection of the upper respiratory tract to mucous membranes rendered more vulnerable by the virus are three: broncho-pneumonia, enteritis, and otitis media. All three may coexist or may follow speedily one after the other, the commonest sequence being in the order named. Ordinarily beginning during the eruptive period, broncho-pneumonia and enteritis are occasionally late complications. Otitis media may also occur quite early in the attack, especially if the middle ear has been previously damaged, but its incidence is more usual during the second week of the disease.

BRONCHO-PNEUMONIA

Prognosis in broncho-pneumonia depends primarily upon the general factors already discussed, and secondly upon the stage at which the patient comes under treatment. Too often practitioners are called in to treat the broncho-pneumonia of measles only

when the condition is far advanced and the prognosis hopeless. The first requirement of *any* measles patient is an abundance of fresh air, which may be quite unobtainable in his home. Provided that bodily warmth is maintained and there is protection from rain, the child suffering from broncho-pneumonia is best nursed under the open window or upon a balcony. For the desperate case it may be deemed necessary to administer oxygen; if so, the funnel method is merely wasteful; administration by nasal catheter is an improvement but far from efficient. Observation has led me to the conclusion that failing Poulton's or some other type of oxygen tents (which are now available in all the infectious diseases hospitals of the London County Council) circulating air from an open window is preferable to oxygen from a funnel or catheter. It need not be added that the condition of the right heart must be watched and improved by cardiac drugs such as coramine nor that, if the temperature fails to drop with the abatement of the broncho-pneumonic process, the presence of pus must be suspected, probably in the pleural cavity but possibly in the middle ear or mastoid antrum.

ENTERITIS

The clinical diagnosis is obvious; bacteriologically, non-lactose fermenters are rarely found; the enteritis has resulted from the swallowing of muco-pus derived from the upper respiratory tract. Prognosis depends upon the promptness with which dehydration is countered and the coexistence or not of broncho-pneumonia.

OTITIS MEDIA

From the point of view of the physical and educational future of the child, rather from that of its immediate effects, otitis media is the most important complication of measles, since, if neglected, it is a potent cause not only of chronic ill-health, but of deafness and deaf-mutism. Promptly and adequately treated, the prognosis as regards a healed drum-head and unimpaired hearing is favourable. The advice of an otologist should be sought as soon as possible in every case of otorrhœa in measles. A number of cases of catarrhal otitis media occur and subside spontaneously without perforation, but when perforation does occur it may be with so little warning that primary paracentesis is out of the question. Mastoiditis is of rare occurrence if the middle ear is treated early and upon proper lines; otogenic meningitis is an occasional sequel of mastoiditis.

Among the less common complications of measles which may affect prognosis the following must be noted.

LARYNGITIS

Towards the end of the catarrhal stage laryngitis sometimes causes such a degree of obstruction to the airway that tracheotomy is contemplated and has, on occasion, been performed. Provided that laryngeal diphtheria can be excluded, the operation is better avoided not only because the results are almost uniformly bad, broncho-pneumonia being a nearly inevitable sequel, but also because in most cases the severity of the laryngitis abates as the rash appears. The child should be placed in an atmosphere of steam, and although, in the absence of diphtheria, the effect must be non-specific, a moderate dose of antitoxin (16,000 units) frequently appears to afford relief in a few hours. Laryngitis which persists into convalescence probably indicates ulceration which may ultimately result in stenosis; expert advice should be sought.

CORNEAL ULCER

Pronounced conjunctival injection and photophobia are of common occurrence in the catarrhal and early eruptive stages and the conjunctiva thereafter is prone to bacterial invasion which may be minimised by daily nursing attention to the eyes. Corneal ulcers even when promptly treated leave nebulae which, if central, may impair vision permanently; if they are not promptly treated, panophthalmitis and possibly sympathetic ophthalmia may result. Daily attention reduces the incidence, too, of the minor but tedious infections of the lids, blepharitis, hordeolum, and chalazion, to which measles patients are liable.

AFFECTIONS OF THE BUCCAL MUCOSA

In many cases of measles, especially in infants, the erythematous-pultaceous stomatitis of Comby may be troublesome during the catarrhal stage, but usually subsides with the exanthem; it may persist and become ulcerative. This is a serious condition which may result in the death of the child from septic absorption or from aspiration broncho-pneumonia. Attention must be drawn also to the significance in measles of the Plaut-Vincent infection of spirochæte and fusiform bacillus; this may involve the mucous membranes of the buccal cavity during the convalescent stage in debilitated children. The complication may take the form of Vincent's angina, stomatitis, or gingivitis, and unless promptly treated, preferably by injections of N.A.B. and local applications of potassium chlorate, may result not only in great debility but by extension to the mucous membrane of the cheek in the dreaded, but fortunately rare, cancerum oris. When this supervenes nothing short of surgical measures may avail to save life.

ENCEPHALITIS

Encephalitis, possibly due to the activation of an existing virus infection by the virus of measles, is a rare but serious complication which may occur at any stage of the attack, but most usually as the rash is fading. Pyrexia, drowsiness, and convulsions passing into stupor, together with muscular twitchings, are characteristic. This syndrome may clear up completely without residual damage or may be followed by spastic paralyse and other manifestations of damage to the central nervous system (see F. R. Ford, Bull. Johns Hopkins Hosp., 1928, xliii., 140, for an analysis of cases in the literature and a full clinical description).

Associated Specific Infections

Concurrent whooping-cough is not unusual and increases the liability to broncho-pneumonia. Diphtheria, which may involve the larynx, is obviously a severe additional handicap. Scarlet fever, chiefly because it implies the addition of other strains of the hæmolytic streptococcus to the flora of the upper respiratory tract, increases the likelihood of otitis media. If there is reason to suppose that the measles patient may have been exposed to diphtheria or scarlet fever it is wise to inject at once a prophylactic dose of the appropriate antitoxin, Schick and Dick tests being omitted in young children. It is still wiser to combine the two antitoxins in one injection containing in 5 c.cm. 2000 units of diphtheria antitoxin and about 4 c.cm. of scarlet fever antitoxin. Diphtheria and scarlet fever patients who have been exposed to measles should receive convalescent or adult immune serum, preferably with the aim of

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SPECIAL ARTICLES

FOOD, HEALTH AND INCOME

A NATIONAL SURVEY OF NUTRITION

For the first time the food position of the country has been surveyed on a large scale to show the relationship of income, food, and health. The investigation, which relies largely upon statistical methods, has been undertaken by the staff of the Rowett Institute in coöperation with the staff of the Market Supply Committee. It is described by Sir John Orr, M.D., F.R.S., director of the institute.¹

Instead of discussing minimum requirements, about which there has been so much controversy, the report considers optimum requirements. These are based on the physiological ideal, defined as "a state of health such that no improvement can be effected by a change in the diet," and the standard of adequacy of diet adopted is one which will maintain this standard of perfect nutrition.

The survey attempts to find out the proportion of the population attaining this standard; and the state of health of the country is reviewed to determine how far inadequacy of diet is reflected in poor physique and impaired health. The tentative conclusion is found that a diet completely adequate for health according to modern standards is reached at an income level above that of half the population. The important aspect of the survey is the inadequacy of the diets of the lower income-groups and the much lower standard of health of the people (especially of the children) in these groups compared with those who have more money.

HISTORICAL COMPARISONS

In 1835 the prices of bread and flour were much the same as they are to-day, but the average consumption per head was 80 per cent. greater. The consumption of sugar was 20 lb. per head, whereas now it is 100. This increase has, of course, been rendered possible by the great fall in price; sugar, which was about 6d. a lb. in 1835, now costs less than half as much.

A committee of the British Association appointed in 1881 gave the first estimates of food consumption. Comparing the figures of 1934 with those estimates, the most striking changes are: consumption per

¹ Food, Health, and Income. Report on a Survey of Adequacy of Diet in relation to Income. By John Boyd Orr. London: Macmillan and Co., Ltd. 1936. Pp. 72. 2s. 6d.

(Continued from preceding page)

prevention rather than attenuation, especially children under 3 years of age.

According to Kohn and Koiransky, radiological evidence supports the belief that peribronchial infiltration occurs in every case of measles, mild or severe. The frequency with which measles lights up a latent focus of tuberculosis is disputed, but there is no doubt that it occasionally does so and that rapid dissemination may result. Far more important, but as yet not accurately assessed, is the extent to which measles complicated by broncho-pneumonia is the starting point of fibroid lung and bronchiectasis.

E. H. R. HARRIES, M.D., D.P.H.,
Medical Superintendent, North-Eastern
Hospital (L.C.C.).

head of bread and potatoes is 30 per cent. less; of meat 45 per cent. more; of sugar 40 per cent. more; of tea and butter the consumption is double. The same trend of changes is shown by comparison of the figures of 1934 with those of 1909-13 and 1924-28.

METHODS OF INVESTIGATION

To get an idea of the diet in different sections of the community, the whole population was classified, according to the income per head, into six groups; those at the top and bottom consisting of 10 per cent., and the four intermediate groups of 20 per cent. of the population. The composition of these groups was obtained by statistical analysis of a large number of figures, taken from income-tax statistics, wage statistics, and data relating to unemployment, old-age pensions, and other forms of social income. These figures were correlated with a sample taken from the 1931 Population Census and designed to yield information on the sizes of the families and the ratio of earners to dependants in different occupation groups.

The six groups had average incomes per head per week of 10s. and less (group I.), 10-15s., 15-20s., 20-30s., 30-45s., and 45s. and over (group VI.). The corresponding estimated average expenditures on food were 4s. (group I.), rising by 2s. increments to 14s. per head weekly (group VI.). The average income per head was 30s. and the average expenditure on food 9s.

Since the income per head is the income of the family divided by the number of persons supported, an average per head income of (say) 30s. per week may be reached in many ways—for instance, by a skilled worker at £3 per week with only a wife to support, by a worker and his wife both in employment with earnings of 38s. and 22s. per week, or by a man earning £550 per year with a wife, four children, and a maid. This means that any one group will contain a heterogeneous collection of occupations, wage-earners, and non-earners. The poorest 10 per cent. of the population (group I.) consist in the main of families having a disproportionate number of children or other dependants per earner. It is estimated that half the persons in this group are children under 14 and that it contains between 20 and 25 per cent. of the children in the country.

The total food-supply of the country having been estimated, its distribution among the different income groups was estimated from 1152 family budgets. These ranged from very poor families spending less than 2s. per head weekly on food, up to families with an income of £2000 per annum spending 15s. or more per head weekly on food. The composition of the average diet of each group was then examined.

CONSUMPTION OF PARTICULAR FOODS AT DIFFERENT INCOME LEVELS

The consumption of flour (see Fig. 1) and of potatoes is remarkably uniform in all groups except I. and VI. In group VI. there is evidence that more expensive foods are substituted for potatoes and bread. In the lowest group there is no indication of any substitution, nor indeed is there any cheaper food which could be substituted for potatoes and bread. It looks as if the purchasing power of this group is so low that the consumption of even the cheapest foodstuffs is limited; or, what is more probable, the appetite in the lowest income-group is

below the average—one of the first signs of sub-optimal nutrition being diminished appetite.

Graphs published in the report show that as income rises the consumption of margarine falls and of butter rises; but if butter, margarine, lard, suet, and dripping are grouped together the total fat consumption rises steadily with income. The consumption of meat, fish, milk, eggs, sugar, vegetables, and fruit increases with income. The figures for milk, fish, and fruit are shown in Fig. 1.

COMPARISONS OF DIET AND STANDARD REQUIREMENT

The next step is the comparison of the quantities of the constituents in the average diets of each group with the amounts required for health. The standards of requirements adopted are those compiled by Stiebeling, of the United States Government Bureau of Home Economics. The vitamin requirement for health is taken as twice that which will prevent the occurrence of obvious deficiency disease. An ample supply is necessary since it is known that there are minor degrees of ill-health caused by deficiencies of vitamins not great enough to show obvious symptoms. For mineral elements the standards are based on the minimum requirements for the maintenance of a positive balance plus an allowance of 50 per cent. for additional requirements of maintenance of health.

Assuming the validity of the standards, the average diet of group I. is found to be inadequate for perfect health in all the constituents considered. Group II. is adequate only in total proteins and total fat; group III. is adequate in energy value, protein, and fat, but is below standard in minerals and vitamins; group IV. is adequate in iron, phosphorus, and vitamins, but probably below standard in calcium; group V. has ample margin of safety in everything with the possible exception of calcium; in group VI. all standard requirements are exceeded. These results are shown in Fig. 2. The quality of the protein is important, especially for children; and the percentages of protein and fat of animal origin, which are of higher biological value than those of plant origin, increase from group to group. Hence the intake of the several constituents increases in quality and in quantity with expenditure.

It should be kept in view that the standards with which the above comparisons are made are for the maintenance of perfect health, which is a standard

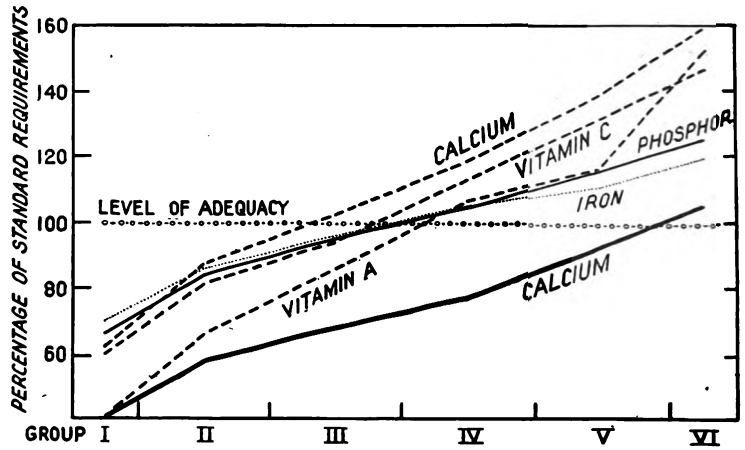


FIG. 2.—Average intake of vitamins and minerals by income-groups. (Modified from the Report.)

very different from the average health of the community. That average diets of the lower income-groups are inadequate according to these standards does not mean that these people are starving or even suffering from such ill-health as is recognised in the term disease. These diets may suffice to maintain life and a certain degree of activity, yet may be inadequate for the maintenance of the fullest degree of health.

EVIDENCE OF IMPERFECT NUTRITION

Owing to differences in their diet, a comparison of the health of children of the lower income-groups with that of children of the higher should show a slower rate of growth and a greater incidence of deficiency diseases in the former. Stature is largely determined by heredity but the extent to which a child will attain the limit set by heredity is affected by diet. Because of these hereditary factors, data which are numerically few are of little value. Ample data on height and weight of the same race do, however, give an indication of the relative adequacy of diets. A conspicuous difference in the heights of boys drawn from different classes is shown by a large number of observations of council schoolboys and employed males (belonging mainly to groups I. to IV.), and those attending Christ's Hospital School (groups III. to VI.). Thus at 13 years of age the boys of Christ's Hospital School are on the average 2.4 inches taller than those of the council schools. At 17 they are 3.8 inches taller than "employed males" of the same age. Figures taken from observations of public schoolboys (belonging

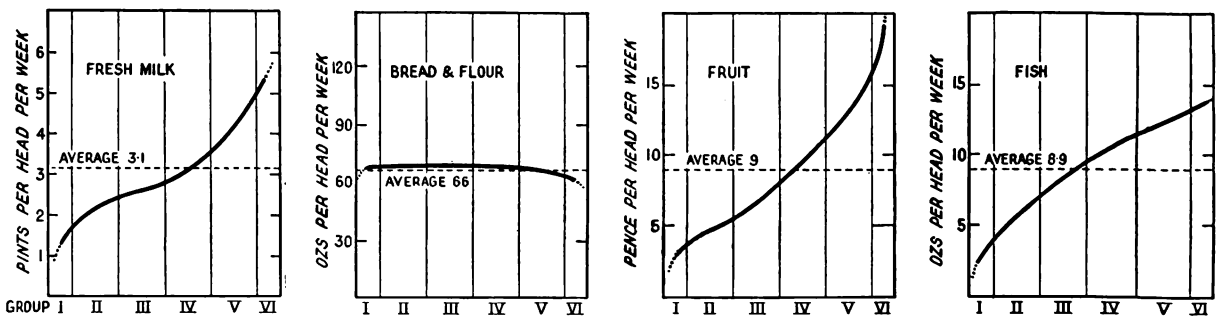


FIG. 1.—Consumption per head of certain foodstuffs by income-groups. The income in Group I. is less than 10s. a week; in Group VI. it is 45s. or over. (Modified from the Report.)

almost entirely to group VI.) show further increase on those for Christ's Hospital.

Three characteristic signs of malnutrition in children—rickets, bad teeth, and anæmia—are fairly widespread in the lower income-groups, the only groups in which extensive observations have been made. There is evidence to show that the same dietary deficiencies which cause these conditions also affect resistance to some infectious diseases, such as pulmonary and intestinal disorders of children.

Such imperfect nutrition in childhood should be traceable as poor physique in adult life and has been found, for instance, in army recruits. Furthermore, susceptibility to some infections, more especially to tuberculosis, is influenced by nutrition and the report states that the most effective line of attack on tuberculosis is probably by improvement of diet.

Figures are insufficient to show the incidence of anæmia in the higher income-groups, but some degree of anæmia is known to be common in women in the lower income groups. This is at least in part preventable and diet is an important factor in its prevention.

The correctness of the general picture presented here has been confirmed by various experiments, in some of which (e.g., Corry Mann) a supplement of milk increased the rate of growth among children. In another, groups of rats kept on diets similar to those of various Indian tribes showed to a remarkable degree the physique and incidence of diseases corresponding to those of the respective tribes (McCarrison). In similar experiments in Scotland, reported in the *Journal of Hygiene* (1935, xxxv., 476), two groups of rats have been given a diet resembling that of income-group I., one group of rats having in addition an abundance of milk and green food. Not only were the rates of growth markedly divergent but the death-rates of the two groups differed conspicuously. The mortality to 140 days of age on the supplemented diet was 11.6 per cent., while for those on the experimental diet the rate was 54.3 per cent. This heavy death-rate was mainly due to epidemic infections to which both groups were equally exposed.

SUMMARY AND CONCLUSION

We reproduce substantially Sir John Orr's concluding statements:—

The food position of the country has been investigated to show the average consumption of the main foodstuffs at different income levels. The standard of food requirements and the standard of health adopted are not the present average but the optimum—i.e., the physiological standard, which, though ideal, is attainable in practice with a national food-supply sufficient to provide a diet adequate for health for any member of the community. The main findings are as follows:

I.—Of an estimated national income of £3750 millions, about £1075 millions are spent on food. This is equivalent to 9s. per head per week.

II.—The consumption of bread and potatoes is practically uniform throughout the different income level groups. Consumption of milk, eggs, fruit, vegetables, meat, and fish rises with income. Thus, in the poorest group the average consumption of milk, including tinned milk, is equivalent to 1.8 pints per head per week; in the wealthiest group 5.5 pints. The poorest group consume 1.5 eggs per head per week; the wealthiest 4.5. The poorest spend 2.4d. on fruit; the wealthiest 1s. 8d.

III.—An examination of the composition of the diets of the different groups shows that the degree of adequacy for health increases as income rises. The average diet of the poorest group, comprising

4½ million people, is, by the standard adopted, deficient in every constituent examined. The second group, comprising 9 million people, is adequate in protein, fat, and carbohydrates, but deficient in all the vitamins and minerals considered. The third group, comprising another 9 million, is deficient in several of the important vitamins and minerals. Complete adequacy is almost reached in group IV. and in the still wealthier groups the diet has a surplus of all constituents considered.

IV.—A review of the state of health of the people of the different groups suggests that, as income increases, disease and death-rate decrease, children grow more quickly, adult stature is greater, and general health and physique improve.

V.—The results of tests on children show that improvement of the diet in the lower groups is accompanied by improvement in health and increased rate of growth, which approximates to that of children in the higher income-groups.

VI.—To make the diet of the poorer groups the same as that of the first group whose diet is adequate for full health (i.e., group IV.) would involve increases in consumption of a number of the more expensive foodstuffs—viz., milk, eggs, butter, fruit, vegetables, and meat—varying from 12 to 25 per cent.

If these findings be accepted as sufficiently accurate to form a working hypothesis, they raise important economic and political problems. Consideration of these is outside the scope of the investigation. It may be pointed out here, however, that one of the main difficulties in dealing with these problems is that they are not within the sphere of any single Department of State. This new knowledge of nutrition, which shows that there can be an enormous improvement in the health and physique of the nation, coming at the same time as the greatly increased powers of producing food, has created an entirely new situation which demands economic statesmanship.

MEDICINE AND THE LAW

The Ruxton Murder Trial

IN his summing-up to the jury at the trial of Dr. Buck Ruxton for murder, Mr. Justice Singleton paid a compliment to the medical witnesses who had been called by the Crown. "Never," he said, "have I seen expert witnesses more careful or more eager not to strain a point against an accused person: there was no evidence to contradict them except by Ruxton himself." Their evidence indeed was vital. Dr. Ruxton's wife and Mary Rogerson, the nurse to his children, were last seen at his house in Lancaster on Sept. 14th; on the 29th dismembered parts of human bodies were found in a ravine at Moffat, Dumfriesshire; there were two heads, and the remains were referred to during the proceedings as body No. 1 and body No. 2, these being alleged to be the remains of Mary Rogerson and Mrs. Ruxton respectively. Dealing with body No. 1 Prof. Glaister, Regius professor of forensic medicine at Glasgow University, described the extent to which tissue and skin had been cut from the face; both eyes had been removed. Asked by the judge if he could see any other reason than the prevention of identification, he observed that the removed parts of the body included those which might have borne signs of asphyxia. The dismemberment had been done by cutting through the joints. There had been bruising before death; blood had been drained away before

it had time to clot. Prof. Glaister put the time between the death and the mutilation as a few hours: he gave 10 to 14 days as the approximate time between death and his examination of the bodies on Oct. 1st, but added that the period could not be scientifically estimated. As for body No. 2 he thought five hours was the minimum time for dismemberment. He found bone changes on the left great toe which frequently accompanied a bunion (there was other evidence that Mrs. Ruxton suffered from a bunion of this nature). He had at first thought that head No. 2 was that of a male: after careful examination and tests he had no personal doubt the head and limbs of No. 2 were those of a female. He described the colour of the hair of the two bodies. Prof. J. G. Brash, professor of anatomy at Edinburgh University, gave his opinion that there were only two bodies and that both were female. He showed that the cast of the left foot of No. 1, on which a stocking was placed, fitted the shoe of Mary Rogerson; similarly that of the left foot of No. 2 fitted the shoe of Mrs. Ruxton. Dr. A. C. W. Hutchinson, dean of the dental school at Edinburgh University, described the state of the teeth in the two skulls; 14 teeth had recently been removed, after or just before death, from head No. 2. Prof. S. Smith, Regius professor of forensic medicine at Edinburgh University, and Dr. W. G. Miller, lecturer in pathology at that University, corroborated details and opinions of the previous witnesses. In addition the officer in charge of the fingerprint department of the Glasgow City Police explained the points of similarity between prints on various articles at the Ruxtons' home and the fingerprints of body No. 1, and between photographs of a palm impression on a table in the house and the left palm of body No. 2.

The rest of the evidence against Dr. Ruxton will be within the recollection of readers of the daily press—his blood-stained clothes, his cut hand, his taking up of the stair carpets, their saturation with blood, the scraping of the walls, the fires in the yard, the locked rooms and the unpleasant smell, the quarrels with his wife and the motive of jealousy, the attempt to persuade witnesses to give untrue evidence as to dates, the sudden disappearance and total silence of the two women, the absence of anyone who saw them leave the house, their omission to take with them any of their clothes or possessions, and the fact that some of the gruesome relics in the ravine were wrapped in a child's garment belonging to the Ruxton nursery. Two other points may be mentioned. Among the remains collected from the ravine were 43 parts, mostly soft parts, which were unassigned to either body: in these was a portion which was taken to be a cyclops eye. Counsel for Dr. Ruxton asked questions apparently suggesting that this might be the sole remaining portion of a human foetus. Dr. Ruxton had at one stage said that Mary Rogerson was pregnant and that she had gone off with Mrs. Ruxton to procure an abortion. Prof. Glaister did not regard this cyclops eye as human. Prof. Brash believed it to be the eye of a pig; had it been human, it would have been the eye of a monstrous foetus. The second point was a question of the admissibility of evidence. Dr. Ruxton stood committed for trial on charges of murdering both his wife and Mary Rogerson; he was actually tried for the murder of his wife only. When evidence was being tendered of Mary Rogerson's clothing, counsel for the defence objected. The Crown contended that the circumstances of Mary Rogerson's death and the identity of one body must materially

assist the identity of the other body. The judge agreed. The issue for the jury was whether or not Dr. Ruxton was proved guilty of the murder of Mrs. Ruxton. If it were the fact that she and Mary Rogerson were both in the house on the evening of Sept. 14th, and thereafter there was evidence that portions of the bodies of both were found in a ravine together, the evidence of the body of Mary Rogerson might be material to the issue. The court would not exclude evidence of her clothing which might be one stage towards identification of her body. The jury must bear in mind that they were inquiring into the death of Mrs. Ruxton only. Admission of the evidence involves the legal subtlety that the presence of remains of Mary Rogerson in the ravine might assist identification of the remains of Mrs. Ruxton in the same place but that no inference must be drawn that the accused, because he had possibly murdered one woman, had probably murdered another. Do juries appreciate these fine distinctions? A like question arose over the direction to the jury recently in *R. v. Waddingham*, where there was a suggestion of the poisoning of Mrs. Baguley though the issue for the jury was the poisoning of her daughter.

Gynæcomasty and Accident

In *Murray v. Northey*, last month at the Surrey assizes, the plaintiff, a young man aged 23 who was employed as a gardener, claimed damages against a motorist. The defendant having admitted negligence, the court had merely to assess the amount of the damages. It was part of the plaintiff's case that enlargement of the mammary gland had developed as a result of the accident. He was knocked off his bicycle a year ago by the defendant's car and was bruised all down the right side from shoulder to ankle; there was a fractured right fibula. Pneumothorax was suspected on the right side but, on examination of X ray photographs, was not established. With regard to the gynæcomasty the plaintiff said that the bruising began to disappear three weeks after the accident; a swelling then begun on the right side of the front of his chest, the place being red, throbbing, and tender. These symptoms subsided fairly soon but during the summer months the swelling slowly increased in size; since October there has been no change in size. Mr. R. M. M. Handfield-Jones, F.R.C.S., giving evidence for the plaintiff, said there was a right-sided development of a normal breast comparable to that of a small virgin female breast at 17 years of age; there was no doubt it was true breast tissue. There appeared to be indisputable evidence that the young man was normal before the accident; his mother and the vicar testified to this. Upon these facts Mr. Handfield-Jones expressed the opinion that the breast development was directly attributable to the injury which had stimulated the breast rudiments. In answer to questions he explained to the court the development of the breasts in both sexes, the abortive effort made by the male breast at puberty, and the known examples of the connexion between trauma and growth. Mr. Russell Howard, F.R.C.S., called as a witness on the other side, described the condition as that of a girl about 12 to 14 years of age. He said he had never known a development of this sort to result from an accident. He did not think that a slight enlargement of the mammary gland in a man of 23 was likely to be so caused. Mr. Justice Finlay accepted Mr. Howard's view and considered that the hypertrophy was a freak of nature which was not due to the accident. Of course there was pain and

suffering as the result of the plaintiff's injuries. The court awarded £300 damages for these.

Dispute over a Locum Tenens

In *Browne-Carthew v. Divecha* at the Westminster county court last month a medical practitioner claimed damages for breach of contract to employ him as locum tenens for the last fortnight of August. He had been engaged through a medical agency and apparently, when he arrived at the house of the defendant doctor for whom he was to act, there was a refusal to let him do the work on the ground that he was too old. The plaintiff was, as a matter of fact, 80 years of age; he asserted that he was nevertheless perfectly fit to do the work required of him. Evidently the court agreed with his assertion; after deducting £3 10s. for board and lodging, the judge awarded him £18 4s. (with costs) as damages for the breaking of the engagement. The judge held that the medical agency was authorised by the defendant doctor to engage a locum tenens, and that the defendant, forming a wrong impression of the plaintiff as a "tottering old man," refused to let him proceed with the contract. There seems to have been some dispute between the defendant and the agency whether the defendant had stipulated for a young man. This did not affect the plaintiff if, as the judge decided, the agency had the defendant's authority to engage him. Doctors who desire to make such a stipulation should remember to make their instructions clear.

Unlawful Use of "Doctor"

The Medical Defence Union does good service to the public as well as to the medical profession when it invokes the law against unregistered practitioners who unlawfully, wilfully, and falsely use the title of doctor, thereby implying that they are registered under the Medical Act. In a prosecution at Brighton last week it was stated that there had been correspondence between the Union and the defendant in September, 1934, when he was calling himself an osteopathic physician and surgeon. He then changed his description to osteopathic practitioner. Last May he described himself as "Doctor" on his notepaper and on the plate outside his premises. The Brighton magistrates fined him £20 with £10 costs.

There may be members of the public who will regard the case as one more instance of professional jealousy and petty persecution. Let it be added then that a detective inspector informed the court that the accused, Francis D. Deacon, aged 57, had been previously convicted for larceny and frauds for which he had been sentenced to two terms of three years' penal servitude and two terms of five years' penal servitude; his last conviction was in July, 1933, when he was sentenced to 12 months' hard labour at Surrey assizes for obtaining credit by fraud. Deacon, said the witness, had often adopted the rôle of doctor in the execution of these frauds. Cases of this kind may persuade laymen that the Medical Act has some modest service to perform for the public in distinguishing the registered from the unregistered practitioner. Since a criminal conviction is a statutory ground for removing a name from the Medical Register, it is all the grosser fraud when a man who has served terms of penal servitude puts "Dr. Deacon" on his notepaper and name-plate.

Illness Supervening upon Accident

In *McCann v. Scottish Coöperative Laundry Ltd.* a woman had an accident to her hand in a steam-presser. She lost a finger and her thumb became stiff

and shrivelled. For a time she received compensation for total incapacity. Presently she became fit for light work and her employers gave her work within her powers at her old wages. She had a permanent partial incapacity, resulting from the accident which occurred in the course of her employment; but she was able to accept her employer's offer of suitable work. Then, as it happened, she was removed to hospital suffering from appendicitis and for six months she was unfit for any work at all. This total incapacity was due to illness entirely unconnected with the accident. Was she entitled to compensation during these six months? Her employers were still offering her light work of a suitable nature, but she was unable to accept the offer. The House of Lords has now decided that the claim to compensation is not satisfied by an offer of work which the workman, through old age or illness, cannot accept. An offer by the employers of work which they know the workman is unable to accept is no better than making no offer at all.

In delivering this judgment of the House of Lords in the workwoman's favour Lord Thankerton found a precedent in *Stowell v. Ellerman Lines* (1923). There an accident made a workman's left hand stiff. Two years later he was found to have total incapacity due to the stiffness and also to hernia, prostate trouble, and old age. This total incapacity could not really be attributed to the accident and the county court judge considered that the total incapacity, due to old age or disease, swallowed up the partial incapacity due to the accident. The Court of Appeal held he was wrong, and the employers had to pay.

PARIS

(FROM OUR OWN CORRESPONDENT)

B C G STATISTICS

THE French Academy of Medicine lives up to its reputation as an international as well as a national forum; and at a recent session two of the principal reports came from abroad. One of them was presented by Dr. Guérin on behalf of Dr. Baudouin, of Montreal, and its subject was eight years' experience of B C G in the province of Quebec. Between June, 1926, and the end of 1934, as many as 5126 children were given B C G. Of these, 582 were living in contact with persons suffering from open or presumably closed tuberculosis, the open cases numbering 249. Serving as controls were 971 children who, though not given B C G, continued to live in tuberculous surroundings, as many as 500 of their tuberculous contacts representing open forms of the disease. All the 1553 children living in tuberculous surroundings were kept under close supervision, and in the calculations of their mortality and morbidity no account was taken of the deaths occurring during the first month of life. Between the ages of one month and seven years the general mortality was 10.3 per cent. for the B C G children and 18.7 per cent. for the controls, the deaths from tuberculosis among the B C G children claiming 2.1 per cent., and among the controls 7 per cent. When account was taken only of the children living in contact with open cases of tuberculosis, it was found that, between the age of one month and seven years, the tuberculosis mortality among the B C G children was only 2.4 per cent., whereas it was 11.1 per cent. among the controls. As for the tuberculosis morbidity among the children in contact with open cases, it was 1.7 per cent. for the B C G children and 6.2 per cent. for the

controls. Dr. Baudouin concludes from these observations that the closer the problem of B C G inoculation is studied, the more evident does its efficacy become.

IS SILICOSIS IN MINERS A DISEASE SUI GENERIS ?

The other foreign report was presented to the Academy by Dr. Rist on behalf of Dr. Vossenaar and Dr. Doubrow, and it concerned miners in Holland. Among 600 miners working as such for more than ten years were 60 who had been employed in the mines for more than 20 years. With only one exception, all these long-term miners possessed radioscopically normal lungs. On the basis of this and other observations, the conclusion is drawn that prolonged work in the dusty atmosphere supposed to generate silicosis does not, as a matter of fact, provoke any clinical or radiological pulmonary sclerosis provided the persons concerned were originally healthy. It is only when chronic pulmonary disease, tuberculosis in particular, has prepared the soil that the lungs may become the seat of disease which in some quarters it is at present fashionable to call silicosis. After presenting this report, Dr. Rist dotted its every *i* and crossed its every *t*, concluding that the problem of silicosis, recently supposed to have been solved, is in reality more obscure than ever. He added that a breach had been made in the wall surrounding the notion that silicosis is a disease sui generis.

RATE-BITE FEVER

A good illustration of the dangers of amateur rat baiting is given by Dr. Louis Ramond in the *Presse Médicale* of March 7th. The rat-baiter in question was a floor-polisher, aged 60, who one morning last December saw a large drain-rat enter his premises uninvited. The floor-polisher pursued his guest with a broom-handle, chasing him till the rat was cornered. In an effort of more or less legitimate self-defence, the rat turned on his pursuer, jumping up and biting his left hand in two places. Having laid out the rat, the floor-polisher made his wounds bleed freely before disinfecting them with chlorinated water. There was practically no local reaction, and the whole incident faded so completely into the background that when the floor-polisher fell ill four days later with high fever and vomiting he did not dream of connecting the rat with his symptoms, and he failed to entertain his doctor with an account of his experiences. So, for many days, his doctor puzzled over such alternative diagnoses as influenza, acute rheumatism, tuberculosis, endocarditis, malaria, typhoid fever, undulant fever, erythema nodosum, syphilis, and measles. It was only when Dr. Ramond was called in to consultation over this case that memories were revived and the necessary clue was given to the correct diagnosis. Apart from the brevity of the incubation period and the almost complete absence of a local reaction, the case was typical enough, with its characteristic rash, the recurrence of bouts of fever punctuated by periods of apyrexia, headache, great general fatigue, and pain in the muscles and joints. Injections of novarsenobenzol were prescribed, and after the third injection had been given, complete apyrexia was achieved. The improvement in other respects was so great that the patient could with confidence anticipate an early return to the polishing of floors. The pity of it was that he was ill for six weeks before a consultant was called in and the correct diagnosis made. Why this delay? Is it that rat-hunters are more diffident about recounting their exploits than lion-hunters?

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

THE HOLMES-ADIE SYNDROME

At the recent meeting of the Medico-Chirurgical Society of Edinburgh, Prof. Edwin Bramwell drew attention to the syndrome in which the pupils do not react to light but show a myotonic contraction on convergence, and in which the tendon-jerks are absent. The condition may affect one or both pupils: the latter are often large, but on maintaining convergence for a period of several seconds they slowly contract to a very small size. Prof. Bramwell emphasised the importance of the syndrome as it is not in any way related to syphilis and is apparently a benign condition. He suggested that, as the cause of the condition is unknown, it should be known as the Holmes-Adie syndrome in recognition of its description by Dr. Gordon Holmes and the late Dr. W. J. Adie.

VOLUNTARY HOSPITALS

Dr. Robert F. Barclay at the annual meeting of the Glasgow Royal Hospital for Sick Children gave some figures. He said there are more than a thousand voluntary hospitals in Great Britain containing 85,000 beds; last year there were 1,250,000 in-patients and 5,500,000 out-patients. The total expenditure and maintenance was about £15,000,000 and the income exceeded that figure by about £1,000,000. In addition, over £3,000,000 was raised for the provision of new buildings and equipment. In the last five years the amount expended on maintenance had increased by £2,500,000. Dr. Barclay submitted that the figures give striking proof of the widespread determination to support voluntary hospitals in the country. He pointed out that, while the local authorities had a duty to see that health services of all kinds are adequate for the needs of the people, it was not their legitimate sphere to use their rating powers to compete with voluntary hospitals. The voluntary hospitals in the west of Scotland, of which there are over fifty, have formed themselves into an association, and he emphasised the importance of the voluntary hospitals in Great Britain being effectively coördinated.

IRELAND

(FROM OUR OWN CORRESPONDENT)

ENFORCED RETIREMENT OF MEDICAL OFFICERS

The Minister for Local Government and Public Health has recently issued a circular to all local authorities suggesting that the normal age for retirement of their various officials should be 65, and that in some cases 60 would be a more suitable age. The circular is intended to cover all officers, professional as well as administrative and clerical, of local authorities. At present in few cases is there any age-limit to the holding of office and all medical officers have been appointed without such limit, and on the understanding that they could not be retired against their will except in case of proved incapacity. Many dispensary medical officers have continued to perform their duties to a much higher age than 65, and in fact the retirement of one at the age of 80 was announced within the last few weeks. There is much to be said against continuance in a strenuous occupation to so advanced an age, but a change cannot be made without a due consideration of existing rights. The Minister has as yet made no statement as to the manner in which he will com-

pensate those whose terms of appointment may be varied without their consent. As the law stands it does not appear that a local authority has power to dismiss an officer on the ground of age alone, but only when it has been proved to the satisfaction of the Minister that there is incapacity to perform the duties. It is true that the Minister has power to remove an officer under sealed order, but up to the present this power has been understood to be exercisable only in cases of rearrangement of duties, of incapacity, or of misconduct, and has not been exercised in other cases.

FEEES FOR REGISTRATION OF BIRTHS AND DEATHS

Most of the work of registration of births and deaths in the Irish Free State is carried out by the

dispensary medical officers, who are appointed assistant registrars for the purpose. It is admitted that the work is performed efficiently and carefully. There has long been discontent as to the adequacy of the fees paid for this work which have not been altered for some eighty years. Representations have been made to successive Governments asking for an adjustment of the fees to modern conditions. Last year the Minister for Local Government and Public Health promised that the matter would have early attention, and last week, in answer to a parliamentary question, his parliamentary secretary stated that the Government draftsman was engaged in the preparation of a Bill to deal with the matter. He was unable to say, however, how soon the Bill might be expected.

PANEL AND CONTRACT PRACTICE

Almost a Representation

THE London medical benefit subcommittee recently submitted a report in which they recommended that a representation should be made to the Minister for the removal of a practitioner's name from the medical list. This action by a subcommittee other than the medical service subcommittee is unusual, but the circumstances attending it are even more extraordinary.

Three doctors, A., B., and C., were involved. By direction of the Minister the name of Dr. A. was removed from the medical list, following a representation by the committee, as from March 1st, 1935. From that date therefore Dr. A. was debarred from taking part in insurance medical practice either as a principal or as a deputy, and his insured patients were given notice of their right to select another doctor.

On Feb. 19th, 1935, the committee were informed by Dr. B. that he proposed to practise at the surgery occupied by Dr. A. as well as at another address in respect of which his name was already included in the medical list. The committee agreed to Dr. B.'s application, subject to the fulfilment of certain conditions, and he accepted a large proportion of the insured persons formerly on the list of Dr. A. Dr. B. relinquished the address as from July 31st, 1935, and nominated Dr. C. as his successor, to whom were transferred the patients attached to the surgery, some 950 persons.

The committee had reason to think that one of the difficulties leading to the retirement of Dr. B. was the continued occupation of the premises by Dr. A., and when Dr. C. joined the list an inquiry was made of him whether Dr. A. was still residing at that address. Dr. C. replied in the negative. On Jan. 29th, 1936, the surgery was visited and the representatives of the committee were then informed by Dr. C. that the practice did not belong to him, and that he was acting merely in the capacity of an assistant to Dr. A. from whom he was receiving a weekly salary. Dr. C. added that he was unable to prevent interference in the practice by Dr. A., and he gave particulars of the case of an insured person who had been attended by Dr. A. and from whom fees had been received. Dr. C. also stated that he had been induced to give a certificate of incapacity to the mother of the insured person although in fact he had not seen the patient at all. Prior to this visit Dr. C. had called at the committee's office and had complained of the conditions under which he was conducting the practice, admitting that his previous statement that Dr. A. did not reside at the surgery was untrue.

The subcommittee's view of the position was that a practitioner (Dr. A.) having been removed from the medical list by order of the Minister of Health was nevertheless still the owner of the insurance medical practice and was continuing to conduct that practice by means of an agent who acted in the capacity of an

assistant and received a weekly salary for his services. This appeared to be nothing less than a travesty of the intention of the Minister when he declared that the continuance of Dr. A. on the medical list would be prejudicial to the medical service of the insured. While no action could be taken against Dr. A. (although doubtless this will be borne in mind in the event of his applying to the Minister for reinclusion in the medical list, for in such circumstances committees are invited to submit their observations on the application) it appeared to the subcommittee that Dr. C. could not be absolved from complicity, and it was the intention to invite the committee to make a representation to the Minister that the continuance of Dr. C. on the medical list would be prejudicial to the efficiency of the medical service of the insured on the grounds that he had conspired and was conspiring with Dr. A. in the conduct of an insurance medical practice contrary to the provisions of the Act.

The chairman of the subcommittee withdrew the recommendation as Dr. C. had resigned from the medical list and the committee were satisfied that his successor had taken the necessary steps to secure that Dr. A. vacated the premises and had no further interest in the practice.

A Complaint that Failed

An insured person complained that an insurance doctor had refused to continue to provide treatment for him. On June 21st, 1935, he applied to the doctor for treatment for a swollen hand, having previously given notice of his desire to transfer to another doctor as from July 1st, 1935. According to the complainant the doctor questioned him as to why he was transferring and suggested he should obtain treatment from the new doctor, to which he replied that he was transferring because he had changed his address but the transfer would not be effective until the end of the quarter. The insured person added that the doctor prescribed ointment but upon being asked whether the patient should attend again said that it was not necessary. The man, thinking that the doctor was off-hand in his manner towards him, assumed that the doctor was not willing to treat him and accordingly consulted the doctor to whom he was going to transfer, paying him 12s. 6d. and incurring further expense amounting to 4s. for dressings. The doctor denied that he told the patient to obtain treatment from the new doctor and said he knew the man was entitled to treatment from him until the end of the quarter, and added that if he had

wanted the patient to go elsewhere for treatment he would have given his consent to an immediate transfer.

The medical service subcommittee thought there had been a misunderstanding on the part of the insured

person and were satisfied that there was no failure on the part of the doctor to comply with the terms of service. The case does however illustrate the embarrassment caused both to doctors and patients by existing arrangements for local transfers.

PUBLIC HEALTH

A New English Life Table

THE series of English life tables begun by William Farr in 1841 has been regularly carried on by his several successors, a new table being constructed at the conclusion of each decade. The latest addition, just published by the Registrar-General, and officially designated English Life Table No. 10, has been constructed by the Government Actuary, Sir Alfred Watson, on the basis of the 1931 census and the mortality experienced in England and Wales in the three years 1930-32. Although the finer points of actuarial practice, as displayed in graduation formulæ for instance, may escape the attention of the public health worker, there can be no doubt that he will find matters of considerable value and interest in the finished product.

EXPECTATION OF LIFE

For example, taking the expectation of life at birth we find that it has increased for males from 40.2 years in 1841, to 51.5 years in 1910-12, 55.6 in 1920-22, and 58.7 in 1930-32, the corresponding figures for females being 42.2, 55.4, 59.6, and 62.9. Thus, at the mortality-rates of 1930-32 the average duration of life from birth for both sexes is a little more than three years above the value given by the death-rates of 1920-22.

It is of some interest to compare the latest values with those of some other countries. Using this expectations of life at birth we find that the present English figures differ inappreciably from those for the white population of the United States, are $2\frac{1}{2}$ - $3\frac{1}{2}$ years better than the corresponding figures for Scotland, but are still 5-6 years below the figures for New Zealand, the country which at present enjoys the highest expectation of life at birth in the world.

The value at birth gives, of course, only a limited view of the mortality experience. Comparing the expectations of life at different ages in England and Wales in 1920-22 with the values in 1930-32 we find that for both sexes the values have increased, by decreasing amounts as age rises, until age 69 is reached in males and age 78 in females. At these advanced ages the average duration of subsequent life is now rather less than it was in 1920-22 or in 1910-12. It is possible that this deterioration can be explained in terms of the survival of the fittest, that there is a survival to old age in the present generation of weaker members of the community who under the conditions prevailing in the past would have succumbed before old age was reached.

VITALITY OF MARRIED WOMEN

In addition to the National Tables the Government Actuary has calculated a valuable series of sectional tables, by means of which the rates of mortality of females according to marital condition can be compared as well as different sections of the country one with another. The most striking feature in the former investigation is the increase at the younger adult ages in the vitality of married women as compared with single women. Although the

maternal mortality-rate (ratio of deaths assigned to childbirth to total births) has slightly increased, the large reduction in the number of births in recent years has led to a smaller total of deaths from puerperal causes. The reduction in the birth-rate has thereby diminished the rate of mortality among married women at the child-bearing ages.

A comparison of the county boroughs of Durham and Northumberland with the rural districts of the east of England also gives very striking results. Out of every 1000 boys born in the former 96 fail to survive the first year of life compared with only 57 in the latter; of 1000 girls 73 fail to survive in the former and only 45 in the latter. At age 50 the number out of 1000 males who fail to survive to age 60 is in England and Wales 149, in the county boroughs of Durham and Northumberland 165, and in the eastern rural districts 100 only, the corresponding numbers for females being 111, 125, and 97.

HEALTHINESS OF THE OUTER RING

Finally, a special investigation has been made of the mortality of Greater London divided into its two constituent sections (1) London administrative county and (2) the outer ring. The figures indicate the superiority of the mortality experience of the latter over that of the former. Comparison of the London suburban areas with other urban areas in the country as a whole shows that the outer ring of London is conspicuous for the lightness of its death-rates over the whole span of life.

This volume, it will be clear, carries on most effectively the long and honourable line of English life tables.

Medical Members of L.C.C. Committees

The London County Council last Tuesday re-elected Lord Snell as chairman for the ensuing year, and on the recommendation of the general purposes committee approved (amongst others) the names of a number of medical members to serve on various standing committees:

Establishment: Miss E. Rickards, F.R.C.S.

Hospitals and Medical Services: Dr. C. W. Brook, Dr. S. Monckton Copeman, Mr. Somerville Hastings, F.R.C.S., Dr. S. W. Jeger, Dr. F. Barrie Lambert, Miss Rickards, and Dr. Henry Robinson.

Housing and Public Health: Dr. J. A. Gillison.

Mental Hospitals: Dr. Robinson.

Parliamentary: Dr. Bernard Homa and Dr. Jeger.

Public Assistance: Dr. Barrie Lambert.

Public Control: Dr. Homa.

In addition to these Dr. Sophia Jevons was co-opted on the Education Committee; Dr. H. L. Eason and Mr. R. H. P. Orde, Secretary of the British Hospitals Association, on the Hospitals Committee.

Medicine is thus thinly but well represented over the various fields of the Council's activities.

CUMBERLAND INFIRMARY.—Presiding at the annual meeting of this hospital the Bishop of Carlisle spoke of the heavy expense involved by motor and accident cases. During the year their cost to the hospital was £888, of which only about £379 had been recovered.

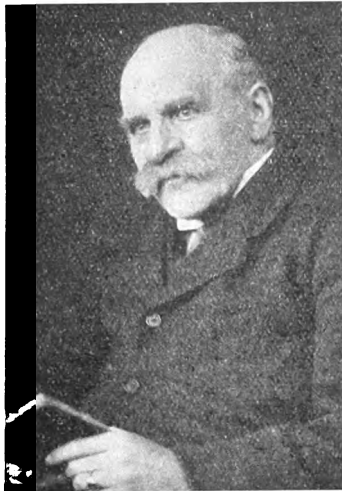
OBITUARY

JOHN SCOTT HALDANE, C.H., F.R.S.

THE death on Sunday last of Prof. J. S. Haldane in his 76th year ends the life and work of one of the greatest—perhaps the greatest—of modern physiologists who for practically half a century has been continuously producing work and thought of the highest order in a great diversity of fields.

In Edinburgh, where he was born and brought up, Haldane began as a philosopher and philosophy remained a lasting interest with him and explains a good deal of what he did and said in later life. His discoveries were made by thinking out what ought to happen and he generally made experiments simply to verify suspicions or conclusions at which he had already arrived; for experimentation to see what

would happen he had little use. And yet, while laboratory work was a relatively minor thing in his life, he is best known to the general run of workers in medical schools nowadays as the originator of incomparably simple and accurate technical methods; the hæmoglobinometer came from an interest in the oxygen-carrying power of the blood, the gas analysis apparatus from an inquiry into deaths after explosions and fires in mines, the alveolar air method of determining the



PROF. HALDANE

(Photograph by Russell)

condition of the respiratory centre from meditation on what probably regulated ordinary respiration. And these three examples explain too the position he held among such diverse people as clinical pathologists, mining engineers, and physiologists: to anything with which he concerned himself, he made additions of knowledge which put him in the front rank. Breathing was perhaps his greatest interest, and he has fortunately left behind him an adequate monument in his "Respiration," Silliman lectures of 20 years ago of which his wonderful vitality allowed him to write a new—really new—edition long after he was 70. In this he covers normal and abnormal breathing as well as other topics which he had illuminated—carbon monoxide poisoning, mountain sickness, and work in compressed air. His interest in mining led him on to some pioneer work on silicosis, the discovery of ankylostomiasis in Cornwall, and the examination of the effect of high temperatures which has more recently matured into an explanation of miners' cramps by salt depletion. Not long ago he surprised us with some striking experiments on colour vision which recalls an earlier interest in the twinkling of stars.

The versatility of which these are but instances—a catalogue would be far too long—was not the product of a volatile mind which is about the last thing of which anyone who knew Haldane would suspect him. For most physiologists, the theme which

holds their various inquiries together is departmental—an interest in the circulation or the central nervous system, sometimes even a liking for some technique. With Haldane, the principle which made all his work coherent was a passion for a philosophical physiology on which he often wrote and lectured: any physiological subject would do to illustrate his general faith. What exactly this was it was often difficult to understand and as was only natural his views went through an evolution and development as his thought and experience progressed. But throughout he had an implacable disbelief in the possibility of explaining what animals did by any available system of chemistry and physics. At first he argued on such things as the apparent secretion of oxygen by the lungs, at any rate in times of stress. Later he attached less importance to the nature of the mechanisms and laid more stress on the ideas that the body works as a whole, and as a whole which is something more than its parts, that organisms cannot be detached from their environments and that their responses follow no hard-and-fast line without respect to circumstances. These views are fairly intelligible to anyone, and his constant insistence that physiology must be looked at in this kind of way has permeated much of the modern work and produced a change of view which has to be seen historically to be appreciated: Haldane's general influence in this way has probably been as important as the special impression which he made on the topics which he took up in detail. Finally he expresses himself as convinced of the necessity of a spiritual interpretation of biology with God as the final reality, a point of view which is perhaps difficult to pass on to anyone who has not felt it for themselves. Haldane's whole career is proof that he found such an outlook a most profitable basis for effective research of all kinds: those who would like to know more of it would do best to read the volume of essays and addresses called "Materialism," and they may be less bewildered than the lady who went to hear one of his Gifford lectures in Glasgow and on being asked how she liked it said "Well enough, though I was a bit disappointed: I thought it was to be about God and he talked about nothing but kidneys": to Haldane the connexion would be clear enough.

Haldane was also a great personality—one of those men who go about with an aura—and those who were lucky enough to be among his pupils at Oxford will know what a pity it is that he had not done any undergraduate teaching for more than 20 years. And yet his freedom from the cares of routine gave him time and opportunity for his wonderful output and there are many graduate students who are profoundly in his debt. Kindly, courteous, considerate, he did not suffer fools gladly, and he was apt to be a little impatient with criticism. There was indeed seldom much room for it.

JAMES RUTHERFORD, L.R.C.P. Edin.,
F.R.F.P.S. Glasg.

Dr. James Rutherford was born in Kirkmichael in 1858, the son of Robert Rutherford, a distinguished Greek and Hebrew scholar. He received his medical training at Anderson's and St. Mungo's Colleges, and at the latter institution was medallist in clinical medicine. He gained his first diplomas in 1894 and served as house physician at the Royal Infirmary, Glasgow. Later he went into practice at Harrogate

where he had a large connexion and also took a prominent part in municipal politics, serving as deputy-mayor of the town during the war. In 1926 he was elected F.R.F.P.S. Glasg. Dr. Rutherford married Amy Eleanor, daughter of Mr. R. Hyde-Parker, of the Wesley College, Sheffield, and was the father of three prominent Harrogate practitioners, Dr. Raphael Rutherford and Mr. Eric Rutherford, who succeed him in his practice, and Dr. Kathleen Rutherford, who is also a practitioner in the town.

THOMAS BABINGTON GRIMSDALE, M.B. Camb.

HONORARY GYNÆCOLOGICAL SURGEON, LIVERPOOL ROYAL INFIRMARY

Thomas Babington Grimsdale, who died suddenly at Seaton, Devon, on March 11th, was the son of Dr. Thomas Frederick Grimsdale, a widely known physician and gynæcologist in Liverpool. He was educated at Uppingham and Trinity College, Cambridge, proceeding to St. George's Hospital for his medical training. At the hospital he was assistant medical registrar and assistant house physician, and graduating as M.B. Camb. in 1883 returned to Liverpool, where he practised with success as a gynæcological surgeon for nearly 40 years.

His first appointments in Liverpool were as assistant medical officer to the Liverpool Hospital for Women and the Liverpool Infirmary for Children, and he was shortly elected to the staff of the Liverpool Royal Infirmary as gynæcological surgeon. The fame of the father and Grimsdale's own merits soon secured for him a high position and a large practice, but just after his appointment to the Royal Infirmary he entered upon a struggle, the recollection of which still remains. It is thus described by "W. M. C.": "Convinced from observation of the work of others and the results of his own experience that aseptic methods should supersede those of the older antiseptic practice, Grimsdale set himself zealously to have the new take the place of the old. In this endeavour he was strongly opposed by certain of his senior colleagues, notably by one who had the ear of the then committee. New-fangled ideas, especially when they involved considerable expense, did not find favour and for a time it seemed that the suggested new enterprise must go to the wall. But Grimsdale, strong in the right of his cause, kept fighting on, an unremitting fight against continued opposition from above, until he won on every point and was successful in getting the new régime established. What is now taken as a matter of course involved the pioneers in a struggle against prejudice almost unbelievable. It is gratifying to be able to record that eventually the chief opponent admitted with all chivalry that Grimsdale had been right."

In the medical school Grimsdale was a successful clinical lecturer and in his contributions to the North of England Obstetrical and Gynæcological Society—of which he became president—and in his communications to the *Liverpool Medico-Chirurgical Journal* he showed his practical knowledge of his subjects. He wrote only occasionally but always delivered a practical message. In his practice he was noted for his scrupulous attention to detail, while he was a very skilful operator. When the war broke out Grimsdale, who had been an acting surgeon in the 4th Lancashire Volunteer Artillery, was too old to go abroad, but he gave valuable surgical help to the St. John Ambulance Brigade V.A.D. Hospital in Liverpool, coming to the assistance of the heavily overworked surgeon to the hospital, the late Mr. G. P.

Newbolt. He retired from the staff of the Royal Infirmary in 1921 being made honorary consulting gynæcological surgeon to the Infirmary, and for the remainder of his life lived in the South of England.

Dr. Grimsdale married Helen, daughter of Mr. Henry Jevons, but had no family. His younger brother, Dr. Harold Grimsdale, is consulting ophthalmic surgeon to St. George's Hospital.

W. M. C. further writes: "By the death of T. B. Grimsdale a long and eminent family medical connexion with our city of Liverpool comes to an end—a connexion dating from 1848 when his father Dr. T. F. Grimsdale began a brilliant career. T. B. Grimsdale, who followed his father in residence at 29, Rodney-street—a Grimsdale home since 1862—would describe himself as the oldest inhabitant of Rodney-street, a thoroughfare of medical renown in the city. He succeeded his father as gynæcological surgeon first on the staff of the Liverpool Hospital for Women and later on that of the Royal Infirmary. The family was a gifted one, and T. B. Grimsdale inherited considerable artistic talent which he exhibited on occasion in the sketches which it was his habit to make of his fellow guests at public dinners during post-prandial eloquence. In his professional work he was meticulous to the last degree, not tolerating carelessness on the part of his coöperators, whether doctors or nurses, while to assist him in his operative work was an education in the technique of abdominal surgery. I often had this privilege and have often felt that I never did so but I learned something in the minutiae of technique. In his time he was an active sportsman. As a cricketer he made occasional appearances in the Lancashire county eleven, while he was captain of his golf club. After retirement he became devoted to fishing."

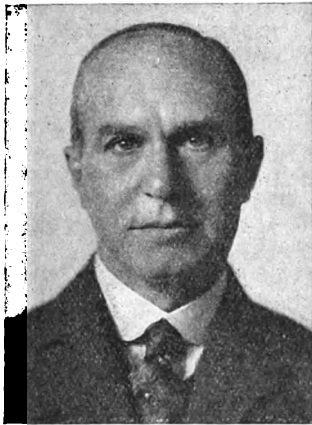
ERNEST HARRISON GRIFFIN, D.S.O., M.C., M.R.C.S. Eng.

THE death occurred on March 10th of Dr. Ernest Griffin, to the regret of a large number of patients and friends acquired in the course of an interesting and adventurous career.

Ernest Harrison Griffin was born at Walsall in 1877 where his father was connected with the *Walsall Observer*. He was educated at Queen Mary's School, Walsall, and entered Peterhouse, Cambridge, as an undergraduate in 1895 where he graduated in arts. He proceeded to Guy's Hospital as a medical student and did some post-graduate work in Paris. He obtained the L.S.A. diploma but did not proceed to medical graduation, commencing at once his picturesque career. He took a post as medical officer in the Venezuelan Rio del Oro Goldfields Company and was for a time surgeon to the El Dorado Gold-mining Company. He received in Venezuela the Order of the Liberator. On his return to England he developed an interest in psychological medicine and for a time acted as assistant physician and pathologist to the Camberwell House Asylum. He also gained the diploma at Cambridge of D.T.M. and Hy. But he had a veritable spirit for adventure and he became surgeon to the Red Crescent Society in the Italo-Turkish war of 1911. In Tripoli he saw very much fighting in a campaign complete with the incidents of guerrilla warfare and was seriously wounded and left on the battlefield for dead. He was, however, rescued, and the recollection of the courage and devotion of his Turkish comrades was always vivid with him. His brief work "Letters of

a Wanderer," written in 1913, deals with many exciting experiences of which he later gave more in a volume entitled "Adventures in Tripoli."

Taking up his life again in England he held the post of resident medical officer to the French Hospital, where he had once been a clinical assistant, but he joined up on the outbreak of the European War as a temporary captain in the R.A.M.C. He soon became conspicuous for his devotion to duty and his remarkable courage. He was wounded several times and thrice mentioned in dispatches; was awarded the M.C. and bar and received the D.S.O. for conspicuous gallantry, the occasion being thus described in the *Gazette* :—



DR. GRIFFIN

[Photograph by Swaine

"He established his dressing station well forward during an attack, and went up to the front line through a storm of artillery and machine-gun fire utterly regardless of personal safety. He moved about in the open for 36 hours without food or rest, attending to the wounded, often leading parties of bearers through heavy barrages until every wounded man had been carried back. He remained behind after the battalion was relieved, still searching for wounded, under heavy fire, though he was several times badly shaken by the explosion of shells."

In 1918 he was reported dead as he had been reported nine years before in the Italo-Turkish war. This occurred during the last great German offensive, when he was found on the battlefield by the Germans to be still alive. In the war hospital he was recognised by the Turkish ambassador through whose representations his release was obtained, and he returned to England, with his health seriously damaged by his terrible experiences, though he remained at work as a specialist in venereal diseases with the Aldershot command.

At the conclusion of hostilities he picked up the threads of his academic career, graduated M.A. at Cambridge, took the English double diploma, and started in practice in Upper Berkeley-street, specialising in medico-physics. He met with considerable success; his interesting personality counted here, while his outspokenness secured confidence and he had thoroughly equipped himself. He always retained his deep interest in Turkey. He became honorary secretary of the British Red Crescent Society and medical officer to the Ottoman Embassy. He was the main founder of the Near and Middle East Association, and was prominent in the development of a body that has done much to shed public light upon many serious political and racial difficulties in Asia Minor and Palestine. He was unmarried.

SIDNEY HERBERT CLARKE, M.D. Camb.

Dr. Sidney Herbert Clarke, who died on March 5th, was the son of the late Dr. J. St. T. Clarke and was educated at Oakham and Gonville and Caius College, Cambridge. He proceeded for his medical education to the London Hospital and graduated as M.B.,

B.C. Camb. in 1905. His first direction of practice was in psychiatry, and he was assistant medical officer to the Leicester and Rutland Asylum, the Newport Borough Asylum, and the County Asylum, Prestwich. In 1909 he obtained the M.D. degree and later commenced practice in St. Albans, being at the time of his death surgeon to the St. Albans and Mid-Herts Hospital, and honorary secretary of the Hertfordshire Medical and Panel Committee.

ROBERT RENDLE LEATHAM, M.B. R.U.I.

CONSULTING PHYSICIAN, BELFAST HOSPITAL FOR SICK CHILDREN

Dr. Robert Leatham, who died recently at his home, Mountnorris, Newcastle, Co. Down, was educated at the Royal Academical Institution, Belfast, and entered the Queen's College as Pakenham Scholar. He graduated in arts with first-class honours in 1889, won the Dunville Studentship two years later, and qualified M.B., B.Ch., B.A.O. with honours in 1893. After holding various resident hospital appointments he commenced practice in Belfast. From the first he took a special interest in children and quickly won their confidence and affection. He loved his work as physician at the Belfast Hospital for Sick Children. His lectures attracted large numbers of students to the hospital for his clinical teaching was always arresting, lucid, and practical, illustrated from his rich clinical experience and his wide knowledge of the literature of pædiatrics. Possessing a logical and analytical mind, he studied each patient with absorption both from a physical and psychological standpoint. The words of Trousseau were true for Leatham—"Il n'y a pas de maladies : il n'y a que des malades." He gave to his patients of his very best, no matter what the giving cost him in nervous energy and physical strength. Thirty years of concentrated work told on a frame never robust, and taking heed to certain subjective cardiac warnings he retired from practice some years ago.

A friend writes: "All though Leatham's life beauty—in nature, in art, in literature, in architecture—had struck a responsive chord in him. On his retirement, still in his prime, he was fortunate in being able to surround himself with the beautiful things he loved. His home, which lay on the foothills of the Mourne Mountains, was surrounded by a garden which at every season of the year was lovely, and his home was filled with beautiful things, furniture and pictures, for he was a connoisseur and a keen and gifted collector. His interest in the Children's Hospital never waned. Ceaselessly he urged the board of management to leave their cramped quarters in the heart of the city and to build a modern hospital in the open space facing the Antrim Hills available close by the Royal Victoria Hospital. Having carried this point he threw himself with enthusiasm and thoroughness into the consideration of plans, and the new Children's Hospital embodies many of his ideas. To-day it stands a permanent memorial to his courage, faith, and generosity."

MEDICAL CONGRESSES AT WIESBADEN.—Owing to the Reichstag election the various congresses arranged to be held at Wiesbaden in the last week in March have been postponed. The Gesellschaft für innere Medizin will meet from April 20th to 23rd, the Röntgen Gesellschaft from April 23rd to 25th; and from April 18th to 20th will meet the Reichsarbeitsgemeinschaft für eine Neue Deutsche Heilkunde. Room reservations are now to be sent to the Städtische Kurverwaltung, Wiesbaden, Germany.

CORRESPONDENCE

THE NUTRITION QUESTION

To the Editor of THE LANCET

SIR,—May I reply to Dr. Hutchison's contention that practitioners in touch with the poorer classes would deny the existence of widespread malnutrition? In assessing malnutrition we are bound to get a great divergence of opinion, as the term is ill-defined. It is also unsatisfactory as it is an aetiological definition. If in its place we substitute the term "unsatisfactory physique," and give this as specific a meaning as we can, we are on safer ground. By unsatisfactory physique I mean a child (I am confining myself here to discussing children) who is below weight, generally below average height, thin, with poor muscle tone and poor posture, who is pale, whose mucous membranes are pale, and who has baggy eyes and a tired look. Such children look prematurely old. I recently found some 70 such cases amongst 240 boys in a poor East End district.

Dr. Hutchison contends that sheer poverty is not a cause of malnutrition. Be that as it may, I think the following figures in connexion with the "unsatisfactory physique" may be of interest. In the course of an investigation, I had occasion to compare two groups of 40 East End children. One group was especially picked to contain only children of the best physique. The other consisted of the type of child described above. In the "good" group, "poor circumstances" (meaning long spells of unemployment, irregular work, or disablement of the father during the child's life) were present in 6 cases; in the "bad" group, poor circumstances occurred in 26. In the "good" group there was only 1 case where the parent declared that at any time during the child's life it had been short of food; in the "poor" group this history was elicited eight times. Parents give notoriously bad histories, but chance alone would not give such a difference. Moreover parents who think their children have not had enough to eat look upon this as a reflection upon themselves, and it needs close questioning to elicit such an admission. Then the most one gets is an answer such as "Well he didn't get all we should have liked him to." This means the child may have had only two meals a day. In bad times it appears that the diet contains little besides potatoes, greens, meat on alternate days, porridge and bread and margarine for breakfast, and for supper tea with some milk and bread and jam.

A number of parents have told me they have gone short themselves to feed their children. The average wage of a family is about £2 5s. a week—seven living on £2 10s. and one case of three on 22s. a week—9s. rent are a few cases that come to my mind. Such cases certainly appear to avoid the dangers of over-nutrition against which Dr. Hutchison warns us!

Obviously other factors such as overcrowding and nervousness play a part. Again, if I may further quote my own figures, 7 cases of nervousness occurred in the "good" group, 13 in the "bad" one, where conditions dependent on poverty predominated.

I submit that it is very important that we should not allow a discussion on malnutrition to become academic because of difficulty in defining the term, or because of prejudices which may have become attached to the word. What is essential to realise is that an enormous number of working-class children are in an unsatisfactory condition compared to those

of the well-to-do classes, and that their condition is due to factors associated with poverty.

I am, Sir, yours faithfully,

W. L. NEUSTATER.

Devonshire-place, W., March 14th

PROGNOSIS IN SPINAL CARIES

To the Editor of THE LANCET

SIR,—I have read with interest Mr. Persy Fisher's kindly criticism of the statistics in my article and hasten to reply. Mr. Fisher has misread the figures. I did deal with only those cases in which a conclusion had been reached, which is exactly what he advocates. The figures then are—

Total cases the outcome of which is known	..	1582
Of these there died	.. .. .	61
Percentage of deaths	.. .. .	3.8

Of the total number of cases admitted (1666) 84 remained under treatment on March 31st, 1935; these do not count for mortality statistics as treatment was not concluded. The error in the causes of death is accounted for in this way: In the causes of death it was stated that 16 children (1.01 per cent.) had died of sepsis and amyloid disease, but in the following table 15 were stated to have died of that condition and 14 other causes. The discrepancy was due to the fact that one of the patients, a child with a tuberculous spine, had a non-tuberculous empyema, which was the cause of death. She was septic and amyloid but death was not due to tubercle and so was entered under "Other causes."

I am, Sir, yours faithfully,

March 16th.

HENRY GAUVAIN.

INTRAVENOUS ANÆSTHESIA FOR
CHILDBIRTH IN A MENTAL HOSPITAL

To the Editor of THE LANCET

SIR,—The care of a pregnant psychotic patient presents a series of problems for which there is no authoritative solution. In spite of the supposed stigma to the coming child it is generally agreed that the primary consideration is the proper treatment of grave mental illness. Antenatal care must be more than usually thorough, since psychotic patients seldom reveal the early symptoms of toxæmia. Special difficulties occur in the diagnosis and management of labour. There is a real danger of depressed or stuporose patients passing quietly and unnoticed through all the stages of labour, and this risk can be avoided only by frequent examinations and careful observation as the patient approaches term. The actual management of labour involves exceptional risks, including violence and a tendency to excessive uterine action. These risks can be avoided by means of continuous anæsthesia. The method of choice is intravenous anæsthesia with Evipan or Pentothal.

Pentothal sodium 1 g. is dissolved in 10 c.cm. redistilled water. Intravenous injection is begun at the onset of strong and regular labour pains. The initial dose of 2 c.cm. is followed a minute later by a further 2 c.cm. The patient is now unconscious and the syringe can be fastened to the forearm. Labour is unaffected but the patient becomes increasingly suggestible and amenable. Gradual emergence from this twilight state is an indication for a further 1 c.cm. This degree of narcosis is conducive to adequate coöperation during the second stage of labour. Repeated injections of 1 c.cm. may be given as often as required, and the twilight state can be deepened into surgical anæsthesia by injecting a further 3 c.cm. This is invaluable

for the performance of obstetric operations or perineal repairs.

At the end of labour it is convenient to inject ergometrine intravenously before removing the syringe. The recovery-rate is very quick and unaccompanied by restlessness. A last and most important observation is that there is no apparent ill-effect on the child. This technique is on the lines suggested recently in your columns by Dr. Jarman and Mr. Abel (*THE LANCET*, Feb. 22nd, p. 422, and March 14th, p. 600).

I am, Sir, yours faithfully,
Dorchester, March 14th. STEPHEN HORSLEY.

PRURITUS OF THE VULVA AND ANUS

To the Editor of *THE LANCET*

SIR,—The causes of the above conditions which are enumerated in the interesting article by Dr. Elizabeth Hunt in your last issue differ widely from those which I see in private practice. In 1929, at your request, I wrote on the treatment of these maladies, and subsequent experience confirms my opinion that the chief cause of vulvar pruritus is a discharge from the vagina, cervix, or uterus. Perhaps it is because gynaecological cases are sent to me for treatment with local ionisation or diathermy that a discharge forms so high a causal proportion among my list of cases of vulvar pruritus and eczema. The most irritating of such discharges is usually due to *B. coli* infection, and when this is accompanied by faecal streptococci the pruritus soon becomes eczematous. Next in order comes *B. coli* urinary infection, and an eruption which I label (perhaps wrongly) streptococcal dermatitis; this may be the rash which others call seborrhœic dermatitis. It shows a vivid erythema on and round the vulva, whilst the thighs, groins, and lower abdomen are covered with small round or ovoid patches, slightly scaly at their edges; where these join the eruption has a circinate margin. On staining the scales no bottle bacilli are seen, nor fungi, but only cocci. Later fissures and weeping develop; the condition responds to the treatment for streptococcal dermatitis. Sometimes this rash follows a vaginal discharge, but quite as often it arises without apparent cause. Tight combinations, with thick folds, especially in winter, appear in some cases to set up this rash. Other causes are friction and perspiration, especially in summer, in stout women, and tight clothing which is contaminated with urine and faeces. Fungal infection was often seen after the war, but of recent years, although it appears to be as common on the feet, I have not seen so many cases of vulvar infection due to this source. Leucoplakia, lichen planus, and diabetes figure rarely in my list of cases. I saw one case of leucoplakia clear up when unnecessary vaginal douches were stopped; but the very next case which came my way soon developed malignant disease, and neither radium nor surgery could avert a fatal issue. Hence, when these cases do not immediately respond to soothing remedies I prefer to send them to a surgeon. Kraurosis in elderly women, on the other hand, usually answers to diathermy with surprising success. I have comparatively recently become aware of another cause of relapsing irritation—namely, *B. coli* infection of the urethra.

As regards the anus, the chief cause of pruritus appears to be extension from streptococcal vulvar infection, paraffin leakage, mucous leakage in association with hæmorrhoids, and threadworms. I am always glad I heard the masterly address by Colonel MacArthur to the British Medical Association at

Eastbourne on this subject. Since then I have found several cases of severe, extensive eczema of the anogenital region, which had been cured more than once and relapsed at varying intervals of time, clear up rapidly and for good when treatment was focused on the threadworms.

I am, Sir, yours faithfully,
Devonshire-place, W., March 16th. AGNES SAVILL.

TREATMENT OF VAGINAL DISCHARGE

To the Editor of *THE LANCET*

SIR,—It has been my experience in Germany that leading professors of gynaecology and obstetrics, as masters of the scalpel and the X rays, sometimes do not take much interest in vaginal discharge and leave the treatment of this minor malady to their assistants. Progress in this field is therefore slow.

The pharmacological industry has produced a great many preparations for treating the condition and Devegan is one of the newest and best recommended of these. A remedy for vaginal discharge, however, has often to be applied for weeks and even months, so that expensive drugs have to be abandoned as the cost becomes too high. I have therefore tried to find a cheaper preparation. I read that Prof. C. J. Gauss, of Würzburg, was recommending Vagintus, a granulated form of aluminium acetate. The salt, which in Germany costs only about 5s. per lb., should be procurable from any chemical manufacturer. But it must be in *granulated* form; the ordinary powder would clot together. Before using it the vagina and cervix is lightly cleaned, through a speculum, with cotton-wool and hydrogen peroxide to remove the alkaline mucus. A teaspoonful of the acetate is placed near the cervix and the vagina is closed with a dry tampon, which the patient removes some hours later. This is done twice a week. If it is convenient for the patient to attend, boric acid powder is introduced on the other days in the same way. The treatment has remarkable effects even after the first application, and nearly always at the second attendance the patients appear happy and pleased at the sudden disappearance of an evil-smelling discharge.

The advantages of the dry aluminium acetate powder treatment are: (1) the remedy is extremely cheap; (2) it has an immediate effect, giving confidence to a patient sometimes in despair through having the discharge for years; (3) it is based on the physiological principle that the reaction of the healthy vagina must be acid. It produces twice or three times a week a strong acid reaction, lasting many hours from the big quantity introduced; and nature generally finds a way to restore the normal healthy flora formed by Döderlein's bacillus of acidum lacticum.

I agree with Mr. Gordon Luker that we have to consider endocervitis or even salpingitis as a common cause of discharge but, in practice, even the most skilful gynaecologists cannot arrive quickly at this diagnosis. I am well acquainted with the American literature of my specialty and I know how many methods, especially that of electrocauterisation of the cervix, have been advocated by them; but all are complicated and give the patient the impression that her condition is serious. In Prof. Gauss's opinion, if we merely cleanse the vagina and produce an acid reaction, the self-helping and self-healing forces of nature may also heal an endocervitis. *Medicus curat, natura sanat.*

I am, Sir, yours faithfully,
London, March 17th. R. KUHN.

A QUESTION OF PROFESSIONAL CONFIDENCE

To the Editor of THE LANCET

SIR,—Particulars of a recent tragedy may serve as a warning to more than one section of your readers. A is a practitioner attending a family in which B is a general servant. B develops what A thinks is an "acute abdomen" and is sent into hospital for operative treatment. In hospital B is found to be suffering from gonococcal salpingitis not requiring operation and is transferred to the "V.D." ward. While in this ward B is visited on the ordinary visiting day by A who, without permission and in the presence of the nurse, takes down and reads the case record on the bed-card. Two days later, and while still in bed in the ward, B receives notice of dismissal from her mistress who is A's patient. B, whose previous record is highly creditable, is now contemplating suicide. I should like to know what my fellow practitioners think of A's action. It is important to add that B is still on his panel.

I am, Sir, yours faithfully,

March 1st.

IATROS.

* * * The case raises medico-legal issues that are repeatedly cropping up in practice. We think A's conduct cannot be defended, because (1) he made use without permission of case records belonging to the hospital; (2) information might be contained in these records which B did not desire to disclose to A; (3) if A communicated to B's mistress (presumably without B's knowledge and consent) information which led to the notice of dismissal two days after his visit to the hospital, A committed a serious breach of professional confidence; (4) if the dismissal was the result of information conveyed by A as to the nature of B's illness, his conduct must be held responsible for the nervous upset made manifest by B's threatened suicide. The fact that B's previous record was "highly creditable" suggests an inquiry whether the diagnosis of gonococcal salpingitis was correct. Was the gonococcus identified in the discharge from the cervix? Was a cultivation made? If not, the precise nature of the salpingitis could hardly be determined unless the tubes were inspected and examined under the microscope. Tuberculous salpingitis may occasionally be acute, or, what is more common, salpingitis may complicate appendicular or colonic inflammation. Infection from contraceptive appliances must also be excluded before assuming a venereal infection. On the other hand, if the diagnosis were correct it is the business of the hospital to make sure that B is treated until she is no longer a possible source of infection, when she could have resumed her employment.—ED. L.

STAMMERING

To the Editor of THE LANCET

SIR,—Miss Kate Emil-Behnke and her family have contributed so much to the literature and analysis of the technique of speech that I am not prepared to argue with her, but she seemed to me to advocate the use of elocution and, in almost the same breath, to say that it was useless. As a self-cured stammerer long before I undertook the cure of other stammerers I believe that the coördination of all the muscles concerned in speech—that is, true elocution—will correct stammering, which is first of all due to unbalanced speech or lack of coördination. From personal experience I know the confidence

which results from a full understanding of the mechanism of speech.

I am, Sir, yours faithfully,

H. ST. JOHN RUMSEY, M.A.,
Speech Therapist, Guy's Hospital.

March 16th.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED
MARCH 7TH, 1936

Notifications.—The following cases of infectious disease were notified during the week: Small-pox 0, scarlet fever 2491, diphtheria 1162, enteric fever 28, acute pneumonia (primary or influenzal) 1431, puerperal fever 44, puerperal pyrexia 152, cerebrospinal fever 26, acute poliomyelitis 3, encephalitis lethargica 6, dysentery 49, ophthalmia neonatorum 86. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on March 13th was 3656, which included: Scarlet fever, 973; diphtheria, 1069; measles, 2138; whooping-cough, 729; puerperal fever, 17 mothers (plus 11 babies); encephalitis lethargica, 283; poliomyelitis, 4. At St. Margaret's Hospital there were 23 babies (plus 15 mothers) with ophthalmia neonatorum.

It will be noted that the number of cases of measles now hospitalised in London amounts to 2183, which is 409 more than last week, and is evidence of the rapid spread of the epidemic of measles in the county.

Deaths.—In 121 great towns, including London, there was no death from small-pox, 3 (0) from enteric fever, 84 (22) from measles, 3 (1) from scarlet fever, 37 (9) from whooping-cough, 41 (1) from diphtheria, 64 (20) from diarrhoea and enteritis under two years, and 112 (28) from influenza. The figures in parentheses are those for London itself.

It will be noticed that the mortality from measles is rising, although not rapidly, the figures for the last six weeks (working backwards) being 84, 88, 78, 58, 34, 41 for the country as a whole and 47, 38, 18, 14, 13, 9 for Greater London. There is a corresponding or even larger rise in the number of cases for which hospital treatment has been sought at L.C.C. hospitals. The inference may be drawn either that the disease is not present in severe form or that the prompt measures taken in London to get serious cases into surroundings where they can be looked after have been successful. Liverpool reported 8 deaths from measles during the week, Willesden and Manchester each 5, Ilford, Leeds, and Preston each 3.

Deaths from influenza throughout the country remain nearly constant. This week they are scattered over 51 great towns, Middlesbrough reporting 5, Newcastle-upon-Tyne, South Shields, and Birmingham each 4, Ealing, Leeds, Sheffield, Leicester, and Nottingham each 3. Manchester reported 6 deaths from whooping-cough, Leeds 3, no other great town more than 2. Deaths from diphtheria were reported from 27 great towns, 3 each from Hull, Liverpool, and Newcastle-upon-Tyne.

The number of stillbirths notified during the week was 300 (corresponding to a rate of 44 per 1000 total births), including 44 in London. The number 300 has not been reached before since official notification was instituted.

IVORY CROSS FUND.—The annual general meeting of the Ivory Cross National Dental Aid Fund was held on March 12th. The council confirmed the decision of the executive committee, publicly announced over a year ago, not to accept donations which are the proceeds of gambling parties, nor in future to be associated with anyone employing such methods for raising money. The hope was expressed that their action would be widely followed by many charitable organisations which in the past had, under the pressure of need, accepted money that had been raised in this way. It was announced that the executive committee were negotiating with the commissioner for the special areas with a view to extending the work of the Ivory Cross Fund in certain special areas, with particular reference to the treatment of adolescents at junior instruction centres and at juvenile clubs. In present circumstances youths from 14 or 15 to 19 years of age are not entitled to dental benefit under the present health insurance Acts which, in any case, only give dental benefit to 50 per cent. of the male and 30 per cent. of the female members of approved societies.

MEDICAL NEWS

University of Oxford

On May 5th a proposal to establish an institute of experimental psychology at Oxford is to be put forward in convocation. An anonymous donor has already offered £10,000 towards the scheme, and Dr. William Brown will be proposed as first director.

University of Cambridge

On March 13th the following degrees were conferred:—
M.D.—R. Huxley Fish and M. S. Spink.
M.B. & B.Chir.—*J. R. Duffield, R. M. Yeo, and W. G. Q. Mills.
B.Chir.—C. U. Gregson and W. M. Beattie.
 * By proxy.

University of Edinburgh

The senatus of the University has resolved to offer the hon. degree of LL.D. to Dr. Mervyn Gordon, F.R.S., consulting bacteriologist to St. Bartholomew's Hospital, and Colonel the Hon. Murray Maclaren, M.D., lieutenant governor of New Brunswick.

The Paterson travelling scholarship has been awarded to Dr. G. Bowman Ludlam.

Congress of Experimental Cytology

The fourth International Congress for Experimental Cytology will be held in Copenhagen from August 10th to 15th. The chief subjects to be discussed are: the physical chemistry of the cell, histochemical problems and cell metabolism, experimental morphology, the electrophysiology of the cell, experimental cell pathology, and the biology of irradiation. Further information may be had from Dr. Harald Okkels, Institute for Pathological Anatomy, 11, Frederik 5' Vej, Copenhagen.

Royal College of Surgeons of England

A meeting of the council was held on March 12th with Sir Cuthbert Wallace, the president, in the chair. Mr. E. K. Martin was elected to the court of examiners, and Mr. F. N. Doubleday to the dental section of the board of examiners in dental surgery. It was decided that a graduate in dental surgery (M.D.S. or B.D.S.) of a recognised university in the United Kingdom shall in future be exempt from the whole of the first examination for the licence in dental surgery, and be admitted direct to the second and final examinations. It was also decided that private pupilage in dental mechanics need not necessarily be taken after the preliminary examination in general education has been passed.

A reception will be held at the College on Monday, July 6th.

It was decided that a further guarantee of £1625 from the Proffit trust fund should be given towards the expenditure of the governing body of the Radium Beam Therapy Research for 1937. Mr. G. E. Gask has undertaken to give a lecture on Feb. 15th, 1937, on the recently acquired Hunterian manuscripts relating to the British campaign in Portugal in 1762-3. Mr. Ernest W. Hey Groves was elected to represent the college on the General Medical Council, and on the inter-departmental committee of the Ministry of Health on the restoration of the working capacity of persons injured by accidents, and Sir Holburt Waring was elected representative of the college at the centenary celebrations of the University of London.

Licences in dental surgery were granted to the following:

Cecil Adair, G. H. Austin-Smith, N. A. Blay, O. B. Brears, W. H. Burndred, F. J. M. Bustard, A. O. Chick, G. R. Cogdon, R. F. Collens, D. C. J. Constable, W. F. Cooper, H. F. W. Dornhorst, T. P. Ellis, C. B. Frost, M. E. Gascoine, S. N. Ghose, W. H. Groom, G. A. B. Hoby, R. L. B. Hollick, Sidney Hurst, P. B. John, Tobias Kaufman, G. R. Lamont, J. L. MacDougall, J. D. Moore, M. R. Preston, H. C. Siggers, Erich Strasburger, E. F. J. Sumner, P. H. Tatchell, D. K. Toulson, K. J. Tovey, and R. S. Yates.

Diplomas in ophthalmic medicine and surgery were granted jointly with the Royal College of Physicians to the following:

Frank Badrock, P. N. Chaudhuri, J. E. Clark, T. K. Clifford, S. P. Divatia, G. B. Ebbage, W. H. V. D. Ferdinands, Frank Heckford, T. J. Howell, H. A. Ibrahim, F. J. Jensen, A. de B. Joyce, Joshua Mazell, B. F. Moore, Sidheshwar Nath, Triloki Nath, George Pollock, E. P. Tulloh, Norman Wren, and E. C. Zorab.

University of London

The following have been recognised as university teachers at the schools indicated: Dr. Una Ledingham (Royal Free Hospital), Dr. C. E. Brunton (London Hospital medical college), Mr. D. H. MacLeod (St. Mary's Hospital medical school), Mr. J. O. Irwin, D.Sc. (London School of Hygiene), and Dr. Duncan White (British Postgraduate medical school). Mr. J. D. Barris and Prof. F. J. Browne have been appointed examiners in obstetrics and gynaecology for the M.D. examination in 1936, and Dr. Doris Baker, Dr. Charles Porter, and Dr. Anna Broman as examiners for the diploma in the theory and practice of physical education in 1936.

A university chair of biochemistry tenable at St. Bartholomew's Hospital medical college and a university readership at the London Hospital medical college have been established. Applications should be sent to the registrar of the University at South Kensington, S.W.7, not later than March 31st for the chair, and April 15th for the readership.

The subject chosen for the Rogers prize essay for 1936 is the natural history of peptic ulcers. The competition is open to all registered practitioners of the United Kingdom, and the essays should reach the vice-chancellor by April 30th. Further information may be had from the academic registrar.

National University of Ireland

On March 12th the degree of M.D. was conferred on M. P. O'Connor. Dr. Timothy Donovan was appointed to the lectureship in materia medica, and Dr. E. V. Cantillon to the lectureship in therapeutics, in University College, Cork.

Auxiliary Royal Army Medical Corps Funds

The annual meeting of members will be held at 5.15 p.m. on Friday, April 3rd, at 11, Chandos-street, when the financial statement for 1935 will be presented and the officers and committee for the current year elected.

Congress on Physical Medicine

The sixth International Congress of Physical Medicine will be held in London from May 12th to 16th under the presidency of Lord Horder. The hon. secretary is Dr. Albert Eidinow, 4, Upper Wimpole-street, W. 1. Lord Horder will take the chair at a luncheon at the Langham Hotel on April 8th, when he is to give an address on the progress of physical medicine with special reference to the congress.

Institute of Medical Psychology

The research fellowship offered by the Rockefeller Foundation and tenable at this institute has been awarded to Dr. A. T. Wilson for research into the relation between the emotional and organic factors in certain physical disorders. Dr. Wilson, a graduate of Glasgow and an assistant physician at the institute, was formerly senior assistant in the department of physiology at the Middlesex Hospital.

British Postgraduate Medical School

An intensive course intended primarily for practitioners will be held at this school from April 15th to 26th (10.30 to 4.30 daily). Among those giving lectures and demonstrations will be Prof. F. R. Fraser, Dr. John Parkinson, Prof. James Young, Dr. Chassar Moir, Mr. B. W. Williams, Dr. R. D. Lawrence, Mr. A. J. Watson, Dr. R. T. Brain, Sir David Wilkie, Dr. H. Crichton-Miller, Dr. Janet Vaughan, Mr. P. H. Mitchiner, Mr. F. M. Loughnane, and Dr. G. W. Bray. Sessions will also be held at the Royal London Ophthalmic Hospital; the Hospital for Sick Children, Great Ormond-street; the National Hospital, Queen-square; and the Central London Throat, Nose, and Ear Hospital. Early application for membership of this course is recommended, and further information may be had from the dean of the school, Ducane-road, London, W.12.

On Thursdays from April 9th to May 14th at 2.30 p.m. Dr. W. S. C. Copeman will give six lectures on arthritis.

The King has given permission to Dr. S. M. Vassallo to wear the insignia of the third class of the order of the Brilliant Star of Zanzibar which has been conferred on him by the Sultan.

Aberdeen University Club, London

The ninety-fifth half-yearly dinner will be held at the Café Royal at 7.30 p.m. on Thursday, April 2nd. The chairman of the evening will be Lord Alness, and the hon. secretary's address is 51, Harley-street, London, W.1.

Medical Meeting at Manchester

In connexion with a two-day regional conference of the British Social Hygiene Council a special meeting, for medical men and women only, will be held in the chemistry theatre of the University of Manchester, on Friday, March 27th, at 8 p.m., when Dr. Morna Rawlins, of Guy's Hospital, will speak on the treatment of gonorrhœa in women, and Dr. Tytler Burke, of Salford, on the child with congenital syphilis. Dr. J. J. Butterworth, county medical officer of Lancashire, will be in the chair.

A Badge for Medical Motorists

As reported in our Parliamentary Intelligence, the Minister of Transport was recently asked if he would authorise the attachment of a special badge or the use of a distinctive horn on the cars of medical practitioners, in order that the police might allow them facilities in emergency. Assured that the plan had worked well in Canada, Mr. Hore-Belisha said he would look into the question. We are now informed that the National Motorists' Association is issuing to 40,000 medical men a badge incorporating the red cross, which, it is hoped, will help the public to identify their cars, and give their owners priority or preferential treatment.

British Red Cross Units in Abyssinia

Mr. J. M. Melly, in charge of the first British Red Cross Ambulance Unit, which is now in the neighbourhood of Lake Ashangi, and is treating about a hundred wounded lake, reports heavy losses of stores and material as the result of air bombing. Ten tents have been totally destroyed and 25 are perforated and unusable. All but two weeks' supply of medical and surgical stores are destroyed. Native personnel from the Kenya and Somaliland border, who after the bombardment asked to be repatriated, have left for Dessie in charge of an officer returning to their own country.

Subscriptions towards the work of the two units now in Abyssinia may be sent to the British Red Cross Society, 14, Grosvenor-crescent, London, S.W.1. The cost of maintaining them in the field, apart from unexpected losses, is estimated at £3000 a month.

Tuberculosis Association

The provincial meeting of this society will be held at the Physiology School, Cambridge, on April 2nd, 3rd, and 4th under the presidency of Dr. L. S. T. Burrell. The conference will be opened by a discussion on dispensary organisation at which Dr. R. H. Hazemann (médecin inspecteur of the Seine prefecture), Dr. Heynsius van den Berg (director of the Amsterdam tuberculosis service), and Dr. N. Tattersall (tuberculosis officer, Leeds) will speak. Dr. Russell Reynolds will also give a demonstration of cinematography of the chest. On Friday morning there will be a joint meeting of the association with the international after-care committee of the Union Internationale contre la Tuberculose which will be opened by Prof. Ferd. Bezançon (secretary-general of the union). Dr. Maurice Davidson and Dr. L. B. Stott will read a paper on the capacity for work in pulmonary tuberculosis, and Prof. von Weizsäcker (director of the Heidelberg medical clinic) and Dr. E. Bachmann (secretary of the after-care committee) will also speak. A visit will be paid in the afternoon to Papworth, where there will be a discussion on schemes for after-care to which Dr. Bronkhurst (Berg en Bosch, Bilthoven) and Dr. Pattison (Potts Memorial Hospital, New York) will contribute. On Saturday Prof. Sayé (Barcelona) will speak on chronic miliary tuberculosis, and cases for discussion will be presented by Dr. S. Vere Pearson, Dr. G. T. Hebert, and Mr. H. P. Nelson. The hon. secretary of the association is Dr. Frederick Heaf, Colindale Hospital, London, N.W.9.

Demonstrations of Contraceptive Technique

On Thursday, April 2nd, at 2.30 p.m., at the clinic of the Society, a demonstration of the technique of the use of a variety of contraceptive methods will be given by Mrs. Marie Stopes, D.Sc., and Dr. Evelyn Fisher. Applications for tickets from medical practitioners and senior students should be sent to the hon. secretary, C.B.C., 108, Whitfield-street, London, W.1.

Naval Medical Compassionate Fund

A meeting of the subscribers of this fund will be held at 3.15 p.m. on Friday, April 24th, at the Medical Department, Admiralty, London, S.W.1, to elect six directors.

Fellowship of Medicine and Post-Graduate Medical Association

All-day courses have been arranged in infants' diseases (March 30th to April 4th); in proctology, at St. Mark's Hospital (April 20th to 25th); and in medicine, surgery, and gynaecology, at the Royal Waterloo Hospital (April 27th to May 9th). Afternoon courses will also be held in psychological medicine, at the Maudsley Hospital (April 27th to May 30th), and in ophthalmology, at the Royal Eye Hospital (April 20th to May 1st); and week-end courses at the Victoria Park Hospital in diseases of the heart and lungs (April 18th and 19th), and at the National Temperance Hospital in medicine and surgery (April 4th and 5th). Courses are open only to members and associates of the Fellowship, and further information may be had from the secretary of the Fellowship, 1, Wimpole-street, London, W.1.

University Travel Guild

The University Travel Guild inaugurated a series of Travel Lunches at the Criterion Restaurant on Tuesday last. It is the first organisation of the kind to arrange an air tour for its members, so it was appropriate that the speakers, Mr. Lindsay Everard, M.P., and Miss Amy Johnson, should be famous figures in the flying world. The room was crowded and the audience were much interested in Mr. Everard's address and no doubt noted his remarks on the low cost of the Easter tour to Central Europe which was being organised by the Guild. The flying, he said, worked out at 3½d. a mile, while hotel accommodation, all meals, and sightseeing only added 1½d. a mile to the expense.

The next lunch is being held on May 5th, when H.E. The Yugoslav Minister will be the speaker. All particulars can be obtained from the secretary of the Guild, 25, Cockspur-street, S.W.1.

Dinner to Dr. and Mrs. Fairbairn

On March 5th a dinner was held in the Langham Hotel to bid farewell to Dr. and Mrs. J. S. Fairbairn on the occasion of their leaving London to reside in Lossiemouth. Over one hundred guests were present. Sir Ewen Maclean, president of the British College of Obstetricians and Gynaecologists, was in the chair, and in a happy speech pointed out how much Dr. Fairbairn had furthered the teaching and practice of midwifery throughout Britain. He expressed the general regret at the retirement of Dr. Fairbairn from active practice, and assured him of a warm welcome whenever he came back to London. Dr. Herbert Spencer referred to the impulse which had attracted Dr. Fairbairn to London. Miss Pye, president of the Midwives' Institute, spoke of the support which the interests of the midwives had always received from him, and Lady Richmond, on behalf of the Central Midwives Board, endorsed this acknowledgment. Sir William Willcox, master of the Society of Apothecaries, spoke in warm terms of the affection in which Dr. Fairbairn and Mrs. Fairbairn were held. Dr. Fairbairn, who was greeted with song and cheers, expressed the pleasure it gave him to be received so kindly by so many of his colleagues on the various bodies on which he had served. He preferred to say goodbye and go when the going was good. He would always carry with him the memory of this welcome and farewell. A silver rose bowl with an album of signatures was presented to Dr. and Mrs. Fairbairn by the chairman on behalf of the guests present, and many colleagues from far and near who wrote regretting their inability to attend.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Health Conditions in Offices

IN the House of Commons on March 13th Mr. CREECH JONES moved the second reading of the Offices Regulation Bill. He said that there was practically no systematic or routine inspection of offices to-day, and in view of the appalling conditions which existed in many offices it was evident that the existing legislation was inadequate. All the organisations concerned with clerical workers were pressing for this Bill. There was to-day increasing nervous strain on the workers. It was important that they should have a standard of conditions which would ensure their health. Doctors had said that there was a tendency among clerical workers towards tuberculosis and digestive and nervous disorders arising in part from the conditions of employment. The Bill was based on the report of the Select Committee on Shop Assistants in 1931 and was in accordance with its recommendations and with the methods adopted by the Home Office in recent legislation. The first part of the measure dealt with the sanitation and general conditions in offices, and the second part with the employment of young persons in offices.

Mr. LATHAN, in seconding, said that the Bill provided the Government with an opportunity to show that they were desirous of doing something to protect the health and interests of the non-manual workers. The existing factory and shops legislation would not meet the needs of the situation.

Mr. LEVY moved :

"This House declines to give a second reading to a Bill which, so far as it is efficiently workable, merely re-enacts the existing law in different words, and which will lead to confusion in administration because it brings under its provisions offices which in many cases are regulated either by the Factory Acts or the Shops Acts."

He said that the passing of the Bill would lead to confusion in administration, because it brought under its provisions offices which in many cases were regulated either by the Factory Acts or the Shops Acts.

After further debate,

Sir FRANCIS FREMANTLE said he could reinforce what had been said about the difficulty of complaints. Medical officers of health knew that the law relied upon complaints being brought forward, and it was ridiculous to think that the ordinary employee in an office would bring forward complaints. Vital statisticians themselves had shown that those who entered offices were often those who were less robust; in fact a considerable proportion of those who entered offices were in one way or other delicate. If they were not definitely affected with tubercle they were susceptible to it. Certainly the conditions of working in offices were very inferior from the health point of view compared with those affecting agriculture. Therefore there was all the more reason for improving office conditions. There had been an immense advance in public health in recent years because of the system under which sanitary inspectors and medical officers of health worked, and latterly because of the appointment of health visitors. Much could be done by settling matters through persuasion. There was however the old-time conflict between the Ministry of Health and the Home Office. The medical officers of health for the metropolis did not think that they had the power of inspection. It would be greatly to the advantage of the administration if the law definitely said that work place did include offices and that there was power of inspection without the medical officers having to wait for suspicion of a nuisance.

THE UNDER-SECRETARY'S REPLY

Mr. GEOFFREY LLOYD agreed with what had been said about the increasing importance of office workers. Between 1921 and 1931 the total number of the employed population increased by 10 per cent., but the number of clerical workers increased by 38 per cent. Figures had been given of the tuberculosis-rate among office workers, but there were other classes of indoor workers who unfortunately had a higher tuberculosis mortality. It was argued that the tuberculosis-rate among office workers was due to their working conditions, but certain classes of workers who had higher mortality-rates were subject to the stringent conditions of the Factory Acts in their work. The Government were taking steps to improve the health of office workers and others. There were proposals for the increased organisation of physical education and recreation. Also the provision whereby clerical workers who were not at present governed by a pension scheme could come in on a voluntary basis was valuable. Nobody was quite certain how far the Public Health Acts would be a solution of the problem, or what the position regarding them was. Those Acts dealt with the most important of the provisions concerning sanitation, ventilation, overcrowding, and so on, which were dealt with in the Bill now before the House. But he would not say that the present position under the Public Health Acts was completely satisfactory. Doubts had been continuously raised whether the definition "workshop" included an office and about the general powers of inspection irrespective of complaints. The draft Bill for the Consolidation of the Public Acts—which would be introduced almost immediately—would effect very important changes in matters as they stood at present. It would give powers for the inspectors of local authorities to enter offices. That would produce a body of opinion and knowledge for dealing with special abuses. As the consolidating Bill was being introduced by the Government and would meet the most important needs of the situation he asked that the present Bill should not be given a second reading.

The motion for the second reading of the Bill was negatived by 134 votes to 93. The amendment was then agreed to 109 votes to 78.

Disposition of the Dead

At a meeting of the National Health and Housing Committee on March 11th, Sir FRANCIS FREMANTLE in the chair, Mr. Murray Phelps spoke on the work of the National Council for the Disposition of the Dead. The Council, he said, was concerned to secure revision and codification of the laws in relation to burial and cremation. Under the leadership of Lord Horder, and with the support of affiliated bodies, they were emphasising the public health importance of this question, it being increasingly recognised that the sanitary disposition of the dead and the health of the living are closely related. With the continuous growth of great towns, the sterilisation of land for the erection of cemeteries was regrettable and uneconomic, especially now when crematoria were becoming easily accessible in most parts of the country. Since 1926 the number of cremations had increased from 2800 to over 9000 per annum, and it was hoped to reach the 10,000 mark this year. Mr. Phelps closed by asking the committee to give sympathetic consideration to a Bill for the registration of undertakers that would be introduced in the near future. Mr. R. B. V. Perkins, of the Cremation Society, followed with a brief account of the insurance scheme which now enables the working classes to provide for cremation on the lines which have proved so successful on the continent.

Mr. E. H. Keeling, M.P., has been elected to assist Captain G. S. Elliston in the secretarial work of the Health and Housing Committee.

National Physique and Fitness of Recruits

In the House of Lords on March 17th a debate took place on a motion by Viscount SWINTON, Secretary of State for Air, approving the Government's defence proposals as outlined in the White Paper.

The Earl of CAVAN said that the only disquieting thing in the White Paper was the shortage of picked men. Roughly, 50 per cent. of the applicants were rejected. That was a national reproach. It could be remedied, not by lowering the recruiting standard, but by paying much more attention to the physical condition of the young men of the nation. What was wanted were more food and more open-air games. If measures were now taken seriously to improve the physical welfare of the youth of this country, our recruiting problems would soon be solved.

The debate was adjourned.

In the House of Lords on March 17th, on the motion of Earl DE LA WARR, Parliamentary Secretary to the Board of Education, the Milk (Extension of Temporary Provisions) Bill was read the third time, and passed.

On March 17th, in the House of Lords, Lord BALFOUR of BURLEIGH introduced the Public Health London Bill and Viscount GAGE introduced a Bill to consolidate the enactments relating to National Health Insurance.

Both Bills were read a first time.

HOUSE OF COMMONS

WEDNESDAY, MARCH 11TH

Motor Facilities for Medical Practitioners

Mr. DAY asked the Minister of Transport whether, in view of the many urgent calls made on registered medical practitioners, he would authorise the attachment on their cars of a special badge, and/or consider allowing them the use of a distinctive horn, in order that the police might allow them special facilities to proceed on their way in the case of emergency.—Mr. HORE-BELISHA replied: This suggestion has always been considered impracticable in view of the impossibility of preventing abuse.

Mr. DAY: Is the Minister aware that this plan has worked very satisfactorily in Canada?—Mr. HORE-BELISHA: I was not aware of that fact. If the hon. Member will submit the facts to me I will be glad to look into them.

Guide Dogs for Blind ex-Service Men

Colonel SANDEMAN ALLEN asked the Minister of Pensions whether he was aware that a centre existed at New Brighton for the training of guide dogs for the blind; and whether he was prepared to assist in the provision of these dogs for blind ex-Service men.—Sir JAMES BLINDELL (Lord of the Treasury) replied: The answer to the first part of the question is in the affirmative. I am informed that the Ministry have no fund out of which such assistance could be given. It may be pointed out, however, that a special weekly allowance, in addition to pension, is provided by the Ministry for all cases of total blindness needing constant attendance. Having regard to present-day conditions of road traffic, this is considered to be the more suitable form in which assistance in such cases should be given.

THURSDAY, MARCH 12TH

Medical Attention in Juvenile Training Centres

Brig.-General SPEARS asked the Minister of Labour whether the recommendation of the commissioner for the special areas that simple medical treatment should be given to boys and young men who were prevented from benefiting by training schemes on medical grounds was being complied with; and, if not, if he would assure the House that a decision in regard to this matter would be announced shortly.—Lieut.-Colonel MUIRHEAD (Parliamentary Secretary to the Minister of Labour) replied: Education authorities in England and Wales have power to provide medical treatment for juveniles attending the junior instruction centres conducted by them, and it is my right hon. friend's policy to encourage authorities to make this provision. As regards young men my right

hon. friend is considering with the Departments concerned the medical services already available and the extent, if any, to which it may be necessary to supplement them in the special areas to fit young men for training. I hope that it will be possible to reach a decision shortly.

Vermin-infested Bricks

Mr. KIRBY asked the Minister of Health whether he was prepared to introduce legislation whereby vermin-infested old bricks taken from demolished dwelling-houses should be prohibited from use in the construction of new dwelling-houses of any kind.—Sir KINGSLEY WOOD replied: In view of the power conferred on local authorities by Section 82 of the Housing Act, 1935, to cleanse from vermin any house to which a demolition order or clearance order applies before it is demolished, I do not consider further legislation necessary.

Sulphuric Acid and the Poisons Act

Mr. WILLIAM DUCKWORTH asked the Home Secretary whether he would take steps to amend the Pharmacy and Poisons Act, 1933, so as to make it clear that it was not obligatory for garages and wireless dealers who engaged in the charging of accumulators to be registered as sellers of poisons in so far as such charging involved the use of sulphuric acid.—Sir JOHN SIMON replied: No, Sir. The sale of sulphuric acid in accumulators is clearly exempted from the provisions of the Act by Rule 11 and the third Schedule of the Poisons Rules, 1935.

MONDAY, MARCH 16TH

Bombing of British Red Cross by Italian Aircraft

Mr. WEDGWOOD asked the Secretary of State for Foreign Affairs what had now been done concerning the bombing of the British ambulance by Italian airmen.—Viscount CRANBORNE (Under-Secretary for Foreign Affairs) replied: Since the statement which I made on this subject on Monday last, the Italian Government have communicated a written reply to the representations made by H.M. Ambassador in Rome, a telegraphic summary of which has been communicated by Sir Eric Drummond to my right hon. friend. So far as can be judged from this summary, the Italian Government admit the bombing on March 4th of an encampment furnished with at least one Red Cross sign, but claim that this bombing was in retaliation for the opening of fire upon the aircraft both on March 3rd and 4th. It is claimed that the Italian aircraft were fired on yet again on March 5th from the same locality, but the summary does not show that the Italians admit having bombed the encampment again on that day. The Italian note apparently states that the coincidence of the locality and of the facts permits the identification of this alleged incident with that of which H.M. Government had complained. As to this I can only say that my right hon. friend has noticed considerable discrepancies between the account given in the Italian communication and the report previously communicated by the leader of the British Red Cross Unit concerned, particularly as regards the number of lorries and of Red Cross insignia as well as the location of the encampment. The Italian official statement does not apparently specify who is supposed to have fired on the aircraft, but the Italian press of March 12th explain that it was done by at least a thousand armed men in khaki uniform who emerged from the tents on the approach of the aircraft. Dr. Melly has already denied that there was any firing upon Italian aircraft from the neighbourhood of his camp, but further detailed information is being sought from him. The right hon. gentleman may be assured that H.M. Government will pursue this matter with the utmost energy with the Italian Government as soon as my right hon. friend has obtained Dr. Melly's further comments.

Coal Fires and Atmospheric Pollution

Mr. DAVID ADAMS asked the First Commissioner of Works if he was aware that the department of industrial and scientific research and the leading municipalities of the United Kingdom agreed that coal-burning fires were the prime cause of atmospheric pollution causing injury to the public health and public buildings, added risks to aviation, and other disabilities; why almost all the offices and departments under his control in London were heated

with raw coal; and whether he would introduce and gradually extend the use of smokeless fuel as in the lobbies of this House.—Mr. ORMSBY-GORE replied: Yes, Sir. I am aware of the causes and effects of atmospheric pollution, but I understand that there is a ready market for all the present production of smokeless fuel suitable for open fireplaces; the total sale would not be increased by any order I might give and the question of atmospheric pollution would not be affected. About two-thirds of the accommodation under my control in London is heated by plants consuming smokeless fuel of various kinds; for open fireplaces suitable smokeless fuel is used wherever local circumstances make it possible without unreasonable increase of cost. Apart from the fact that there was some dissatisfaction when smokeless fuel was used in the lobby fires some time ago, I should not be justified at present prices in using smokeless fuel in the fireplaces of this House.

Blind and Insane Pensioners

Mr. MCGOVERN asked the Minister of Pensions the total number of blind and insane persons on pension in Great Britain from the result of the war 1914–18.—Sir JAMES BLENDLELL (Lord of the Treasury) replied: I am informed that the number of pensions in payment in respect of eye affections assessed at 100 per cent. is approximately 1990. The number of pensioners certified as of unsound mind in mental institutions is about 5990.

Sir John Orr's Report on Malnutrition

Mr. ELLIS SMITH asked the Prime Minister if he would consider the Report prepared by Sir John Boyd Orr, and take steps to set up a ministry for food-supply and organise a national distribution of food.—Mr. BALDWIN replied: The report is being referred by my right hon. friend the Minister of Health to the Advisory Committee on Nutrition for examination. The answer to the last part of the question is in the negative.

Mr. JOHNSTON asked the Minister of Health whether he was aware of the serious reports by Sir John Boyd Orr and the staffs of the Rowett Institute and the Market Supply Committee as to the under-nourishment of 10 per cent. of the population and the under-nourishment combined with defective nutrition of other 40 per cent. of the population; whether he was aware of the increasing public health expenditure required as ambulance work owing to this defective nutrition; and what steps the Government proposed to take to cope with the situation.—Sir KINGSLEY WOOD replied: I am aware of these reports and I am referring them to my Advisory Committee on Nutrition for examination.

General Nursing Council Rules

Mr. OSWALD LEWIS asked the Minister of Health if he would give the British Hospitals' Association an opportunity of expressing their opinion upon the new regulations drafted by the General Nursing Council for England and Wales, regarding a proposed educational standard for nurses before he gave his formal approval of such regulations.—Mr. SHAKESPEARE (Parliamentary Secretary to the Ministry of Health) replied: Yes, Sir. My right hon. friend has already done so and he is in communication with the Association on the matter.

Infectious Disease in County Durham

Mr. DAVID ADAMS asked the Minister of Health whether he was aware of the high incidence of infectious disease in the Stanley, County Durham, area, and that this was declared by members of the local authority to be due to the low nutritional standards of the area; and whether he would investigate this situation.—Mr. SHAKESPEARE replied: My right hon. friend is aware of this outbreak; the situation has been under close investigation for some time past, and he is now awaiting a report by the county medical officer of health.

Pasteurisation

Mr. DE ROTHSCHILD asked the Minister of Health whether, in view of the health value of pure clean raw milk, and in view of the high standard of cleanliness of tuberculin-tested milk, he would reconsider the proposal to institute a separate grade of tuberculin-tested pasteurised milk, in order not to restrict the market for the highest grades of pure raw milk by fostering the idea that the safety of even tuberculin-tested milk would be

enhanced by pasteurisation.—Mr. SHAKESPEARE replied: My right hon. friend is giving consideration to this matter in the preparation of the new Special Designations Order.

Milk for Nursing Mothers and Infants

Mr. JOHNSTON asked the Minister of Health whether his attention had been called to the report of the Medical Research Council for 1934 to 1935, just issued, urging the importance of the consumption of more liquid milk by pre-school children and nursing mothers; and whether he would consult with the Secretary of State for Scotland and the Minister of Agriculture with a view to immediate steps being taken to give effect to this recommendation.—Mr. SHAKESPEARE replied: Yes, Sir. My right hon. friend intends to give full consideration to this report in consultation with my right hon. friends the Secretary of State for Scotland and the Minister of Agriculture.

TUESDAY, MARCH 17TH

Typhoid Fever in Derbyshire

Mr. HOLLAND asked the Minister of Health if he was aware that the outbreak of typhoid fever in the village of Langwith, Derbyshire, was reported to be due to a previous water-supply which was pronounced by the district medical officer to be polluted; that at a recent date one person died from the alleged effects of typhoid fever; and in what way compensation would be made, as there was much local indignation concerning this matter.—Sir KINGSLEY WOOD replied: The answer to the first two parts of the question is in the affirmative. As regards the last part, the question of liability to pay compensation is not one on which I can express any opinion. It is a matter which can be determined only by the courts.

Influenza at Chatham Barracks

Captain PLUGGE asked the Secretary of State for War the number of cases of influenza or similar complaints which had occurred within the last month in the Brompton Barracks, Chatham; what had been the death roll; and why in the case of normal colds the mortality had been relatively high.—Mr. DUFF COOPER replied: During the last month there have been 25 cases of influenza, 5 of pneumonia, 3 of bronchitis, and 198 of common cold at Brompton Barracks, Chatham. Four deaths have occurred, three being the result of broncho-pneumonia, influenzal in origin, and the other of lobar pneumonia. Every possible precaution has been taken to prevent the spreading of the outbreak, and reports show that, since the beginning of this month, there has been a steady reduction in the number of admissions to hospital and of barrack treatment.

Births, Marriages, and Deaths

BIRTHS

KIES.—On March 9th, at Hitchin, the wife of Dr. Jean Kies, of Letchworth, of a daughter.
ROBERTS.—On March 15th, the wife of O. W. Roberts, M.D. Lond., F.R.C.S. Eng., Medical Superintendent, Dulwich Hospital, S.E., of a daughter.
WHITCHURCH HOWELL.—On March 11th, 1936, to Frances, née Roper Blackwood, wife of Bernard Whitchurch Howell, F.R.C.S., of 123, Harley-street, W.1—a daughter.

MARRIAGES

FRANCE—POTTER.—On March 8th, at the Parish Church, Ashted, Herbert France, M.R.C.S. Eng., to Muriel Beatrice Potter.

DEATHS

ANDREWS.—On March 13th, at St. Briavel's House, Gloucestershire, Surg. Capt. O. W. Andrews, C.B.E., M.B. Durh., R.N.
CASH.—On March 14th, at Bovey Tracey, S. Devon, Alfred Midgley Cash, M.D. Edin., aged 85.
CAWTHORNE.—On March 12th, Benjamin Walker Cawthorne, M.D. Edin., late of Bath, aged 78.
GRIFFIN.—On March 10th, Ernest Harrison Griffin, D.S.O., M.C., M.R.C.S. Eng.
HALDANE.—At midnight, March 14th–15th, at Chervell Oxford, Prof. John Scott Haldane, C.H., F.R.S., M.D., LL.D. Edin., Fellow of New College, Oxford, aged 75.
MCGEAGH.—On March 12th, at Ramsey, Isle of Man, Robert Thomas McGeagh, M.D. R.U.I., in his 78th year.
WASON.—On March 16th, at Lichfield, Clevedon, Richard Llewellyn, M.R.C.S., L.R.C.P. Lond., eldest son of the late J. E. F. and Annie Wason, and beloved husband of Mary Kathleen Wason.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

- ROYAL SOCIETY OF MEDICINE**, 1, Wimpole-street, W.
MONDAY, March 23rd.
Odontology, 8 P.M. Mr. F. N. Doubleday: 1. Third Molar Removed from Behind the Orbit. 2. Third Molar Removed from Beneath the Tongue. 3. A Case of Facial Deformity Referred by an Industrial Firm. Mr. W. E. Herbert: 4. Unruptured Supernumerary Tooth Causing Death of the Pulp of a Central Incisor. 5. Congenital Absence of Teeth. 6. Fracture of the Roots of Two Incisors where the Pulp has Remained Vital. Mr. G. T. Hankey: 7. Bilateral Perforation of the Antrum and Nose following Chronic Necrosis of the Maxilla. 8. Complete Caries of Permanent Dentition—except Wisdoms—at the age of 13, in an otherwise Normal Boy.
TUESDAY.
Medicine, 5 P.M. Sir Walter Langdon-Brown, Dr. A. P. Thomson, and Dr. P. M. F. Bishop: Medical Aspects of the Menopause.
WEDNESDAY.
Comparative Medicine, 4 P.M. (Royal Veterinary College, Great College-street, N.W.) Demonstrations in Research Institute and College.
THURSDAY.
Urology, 8.30 P.M. Mr. John Everidge: 1. "Staghorn" Calculus Removed from a Single Kidney. Mr. A. E. Roche: 2. Nephrectomy for Uterovaginal Fistula. Mr. Reginald T. Payne: 3. Hyperparathyroidism, including Renal Calculi. Mr. Morton Whitby: 4. Enlarged Prostate (Enucleation-suprapubic with Complete Closure of Bladder). 5. Left Pelvic Renal Calculi with Hydronephrosis Complicated by Acute Gonorrhoea. Mr. H. P. Winsbury-White: 6. Two Cases of Retention of Urine in Women. Mr. James Carver: 7. Blind Supernumerary Ureter. 8. Tuberculous Ureteric Stump. 9. Stricture of the Ureter with Hydro-ureter and Hydronephrosis. Mr. Edgar Freshman: 10. Infected Hydronephrosis in a Horse-shoe Kidney.
FRIDAY.
Physical Medicine, 5.30 P.M. (St. John Clinic and Institute of Physical Medicine, Ranelagh-road, S.W.) Demonstrations and Clinical Cases by Sir Leonard Hill, Mr. Timbrell Fisher, Dr. Francis Bach, Dr. A. P. Cawadias, Dr. Philip Ellman, Dr. Charles Robinson, Dr. Gordon Calthrop, and Dr. Albert Eidinow.
Disease in Children: Obstetrics and Gynaecology: Epidemiology and State Medicine, 4.45 P.M. Dr. J. B. Blaikley and Dr. G. F. Gibberd: Mechanism of Atelectasis and its Treatment by Intratracheal Insufflation. Dr. N. B. Capon, Prof. G. I. Strachan, Dr. Letitia Fairfield, and Dr. Ethel Cassie: The Prevention of Neonatal Death, Injury, and Disease.
MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.
MONDAY, March 23rd.—8.30 P.M., Prof. G. Grey Turner: Surgery of the Oesophagus.
MEDICO-LEGAL SOCIETY.
THURSDAY, March 26th.—8.30 P.M. (Manson House, 26, Portland-place, W.), Dr. L. A. Weatherly: Debatable Medico-legal Episodes in the Long Life of an Alienist.
ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY, 5, Lisle-street, W.C.
WEDNESDAY, March 25th.—4.30 P.M., Clinical Meeting.
BRITISH PSYCHOLOGICAL SOCIETY.
WEDNESDAY, March 25th.—8.30 P.M. (11, Chandos-street, W.), Dr. H. Godwin Baynes: The Importance of Dream Analysis for Psychological Development. Dr. J. A. Hadfield and Dr. C. Wilson will also speak. (Medical Section.)
SOCIETY OF MEDICAL OFFICERS OF HEALTH.
FRIDAY, March 27th.—3.45 P.M. (Park Hospital, Hither Green, S.E.), Dr. H. S. Banks: Clinical Demonstration. (Fever Hospitals Medical Service Group.)
ASSOCIATION OF INDUSTRIAL MEDICAL OFFICERS.
FRIDAY, March 27th.—5.45 P.M. (London School of Hygiene and Tropical Medicine, Keppel-street, W.C.), Air Vice-Marshal Sir David Munro and Dr. T. M. Ling: Physical Standards in Industry. Dr. Ling: Psychological Factors in Sickness Absenteeism.
SATURDAY.—10 A.M., Dr. R. E. Lane: The Prevention of Industrial Plumbism.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

- ROYAL COLLEGE OF PHYSICIANS**, Pall Mall East, S.W.1
TUESDAY, March 24th, and **THURSDAY**.—5 P.M., Mr. Joseph Needham, Sc.D.: Chemical Aspects of Morphogenetic Determination. (Oliver-Sharpey Lectures.)
ROYAL COLLEGE OF SURGEONS, Lincoln's Inn-fields, W.C.
MONDAY, March 23rd.—5 P.M., Dr. L. W. Proger: New Additions to the Museum.
UNIVERSITY OF BIRMINGHAM.
FRIDAY, March 27th.—3.30 P.M. (Queen's Hospital), Prof. Philip Cloake: Diabetes Mellitus.

- ROYAL INSTITUTION**, 21, Albemarle-street, W.
TUESDAY, March 24th.—5.15 P.M., Prof. Edward Mellanby, F.R.S.: Drug-like Actions of Some Foods.
INSTITUTE OF HYGIENE, 28, Portland-place, W.
WEDNESDAY, March 25th.—3.30 P.M., Dr. J. F. Halls: Dally: Psychological Influences on the Circulation.
BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducaane-road, W.
MONDAY, March 23rd.—2.30 P.M., Dr. Gordon Holmes, F.R.S.: Cerebro-spinal Syphilis.
TUESDAY.—2.30 P.M., Dr. Miles: Normal and Abnormal Bacterial Flora.
WEDNESDAY.—Noon, Clinical and pathological conference (medical). 2.30 P.M. Clinical and pathological conference (surgical). 3.30 P.M., Mr. Aleck Bourne: Disproportion and Difficult Labour.
THURSDAY.—2.15 P.M., Dr. Duncan White: Radiological demonstration. 3 P.M., Dr. Chassar Moir: Operative Obstetrics.
FRIDAY.—Noon, Dr. A. A. Davies: Gynaecological Pathology. 3.30 P.M., Dr. Alan Moncrieff: Hygiene of the New-born Child. 5 P.M., Sir James Walton: Surgical Aspects of Dyspepsia.
 Daily, 10 A.M. to 4 P.M., Medical Clinics, Surgical Clinics or operations, Obstetric and Gynaecological Clinics or operations.
FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, March 23rd, to **SUNDAY**, March 29th.—**INFANTS HOSPITAL**, Vincent-square, S.W. Mon., Wed., and Fri. at 8 P.M., primary F.R.C.S. course in anatomy and physiology.—**ROYAL CHEST HOSPITAL**, City-road, E.C. Mon., Wed., and Fri., 8 P.M., special M.R.C.P. class in chest and heart diseases.—**NATIONAL TEMPERANCE HOSPITAL**, Hampstead-road, N.W. Wed., 8.30 P.M., Dr. Reginald Lightwood: Modern Views Concerning Tuberculosis in Children.—**ALL SAINTS' HOSPITAL**, Austral-street, S.E. Sat. and Sun., course in urology. Courses are open only to members of the fellowship.
KING'S COLLEGE HOSPITAL MEDICAL SCHOOL.
TUESDAY, March 24th.—4.30 P.M., Mr. H. A. T. Fairbank: Some General Affections of the Skeleton.
HOSPITAL FOR EPILEPSY AND PARALYSIS, Maida Vale, W.
THURSDAY, March 26th.—3 P.M., Dr. Russell Brain: Demonstration.
NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, March 23rd.—3.30 P.M., Dr. Symonds: Head Injuries (III.).
TUESDAY.—3.30 P.M., Dr. Grainger Stewart: Meningitis and Cerebral Abscess.
WEDNESDAY.—3.30 P.M., Dr. Kinnier Wilson: Clinical Demonstration.
THURSDAY.—3.30 P.M., Dr. Riddoch: Cerebral Tumours.
FRIDAY.—3.30 P.M., Dr. Denny-Brown: Neuritis. Out-patient clinic daily at 2 P.M.
HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
WEDNESDAY, March 25th.—2 P.M., Dr. Wilfred J. Pearson: Deformities of the Chest—Effect upon Respiration. 3 P.M., Dr. W. W. Payne: Sedimentation-rate in Tuberculosis. Out patient Clinics daily at 10 A.M. and ward visits at 2 P.M.
NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.
TUESDAY, March 24th.—5.30 P.M., Dr. F. W. Price: Angina Pectoris.
HAMPSTEAD GENERAL HOSPITAL, N.W.
WEDNESDAY, March 25th.—4 P.M., Dr. H. Van Praagh: Some Pitfalls of General Practice.
MANCHESTER ROYAL INFIRMARY.
FRIDAY, March 27th.—4.15 P.M., Mr. W. R. Douglas: Demonstration of Surgical Cases.
ANCOATS HOSPITAL, Manchester.
THURSDAY, March 26th.—4.15 P.M., Mr. E. E. Hughes: Acute Surgical Conditions of the Kidney.
LEEDS GENERAL INFIRMARY.
TUESDAY, March 24th.—3.30 P.M., Dr. J. T. Ingram: Some Dermatological Neuroses.
GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY, March 25th.—4.15 P.M. (Victoria Infirmary), Mr. Robert Tennent: The Gall-bladder.

ST. ANDREW'S HOSPITAL, DOLLIS HILL.—Plans are being prepared for an extension to the nurses' home of this hospital, and building will probably begin in the spring. The cost will be about £6000, and there is already a debt on the first part of the home and new buildings of £3623. The hospital's income for last year amounted to £13,812 and its expenditure was £15,600.

BATH EAR, NOSE, AND THROAT HOSPITAL.—This hospital celebrates its centenary next year when a special effort will be made to remove its large debt. It is hoped in the near future to undertake more preventive work among children recovering from measles and scarlet fever when the seeds of future deafness are often sown.

NOTES, COMMENTS, AND ABSTRACTS

MEALS FOR THE MILLION

At a meeting in London on March 12th, with Mr. Julian Huxley, D.Sc., in the chair, associates of the Committee against Malnutrition reported on the public food services of Soviet Russia. Mr. F. Le Gros Clark, the hon. secretary, spoke first of the efforts made to popularise the habit of feeding in restaurants and dining halls. At least five million industrial workers, he said, are now receiving one or two meals a day in the factory or public restaurants under the control of the State trusts; and this number does not include office employees or those of the collective farms, where the custom is now spreading rapidly. In earlier days no doubt most of the factory dining halls were little more than canteens; but now that is all changed, and great attention is paid to the aesthetics of dining. Comfort, brightness, and the taste of food are nowadays carefully considered, and flavouring, gravies, and mayonnaises are tested to ensure that the meals constantly improve not only in wholesomeness but in attractiveness.

In fairness to the system, said the speaker, one must prevent the British public from assuming that this social feeding implies the uncomfortable regimentation of the people. If this was granted, it was easy to see that the Soviet Union was wise in encouraging the habit of dining in restaurants; since it could thus guarantee a large proportion of the population one, two, or even three meals a day cheaply and on a diet that was certified pure and varied. It could also in this way discover and deal with the inevitable difficulties associated with the growth of a new public service, the food service. Would the people of Soviet Russia develop further this custom of dining communally or would they revert later to the habit of family meals? This, he thought, was a matter for the people themselves. But with the steady drop in food prices that was now being experienced, the argument that the restaurant meals were cheaper would be removed. One of the decisive factors that would make for the permanence of the restaurant system was the saving in time for the women; another was the conversion of the factory restaurants into comfortable clubs, of which the workers were unquestionably proud.

A further striking feature of the restaurant system was the opportunity it gave for prescribing special diets to those who required them. The science and art of cookery could ensure that these diets were palatable, while adhering strictly to the prescription. Well over half a million factory workers and others were now receiving daily diets on this basis, and figures seemed to indicate that their health was benefiting. Here, said Mr. Le Gros Clark, was the establishment of a great principle, and only by organising in the first stages some kind of communal feeding could the principle be properly tested and its results observed. Extensive studies were being made into the diets most beneficial to different occupations and in different climates. The question, for instance, of wear and tear on the human organism from work in heated conditions was being closely examined. The research was of a highly practical nature. In our own country there was a praiseworthy effort being made by a few employers to supply their young workers with extra milk. This was good, provided that low wages were not being depleted by making the young people pay for their own milk. In the Soviet Union the extra cost of the more expensive health diets referred to was met out of the social insurance funds; these, it must be noted, were on a non-contributory basis.

Enlarging on the problem of tuberculosis, the speaker said that the figures examined showed a considerable drop in mortality and loss of working days in the last few years. In Moscow the tuberculosis death-rate had risen during the civil wars

to 40 per 1000 of population; it was now less than 12, and great efforts were being made in the industrial centres to discover hitherto unsuspected cases. In this campaign the communal dining arrangements played a considerable part. It appeared that in all cases separate tables were allotted to tuberculosis patients, and in a growing number of cases separate compartments; their crockery had by regulation a distinctive pattern on it and must be kept apart.

The report which formed the basis of Mr. Le Gros Clark's address may be had from the Committee Against Malnutrition, 19c, Eagle-street, London, W.C.1. (1d., post free 2d.).

FILING OF CURRENT JOURNALS

THE weekly growing heap of periodicals is an increasing source of annoyance to anyone who has to collect and keep them for reference. He has the choice between a neat pile, useless if undisturbed, or an untidy chaos, recourse to which becomes more and more exasperating. An ingenious binding case has been devised by EASIBIND Ltd. (9, Mallow-street, London, E.C.1) which should help to solve the problem. Different covers can be obtained to fit the main medical and scientific journals and each is attractively made, bearing on the back the name and year of the publication; that for THE LANCET holds all the issues of one volume and costs 3s. 6d. net. Each issue can be inserted within half a minute. A thin wire rod is laid between the middle pages and attached by each end to the back of the cover; the whole is firmly secured by a thicker rod. The growing volume can then be placed among the other reference works on the library shelf. If desired, any particular issue can be removed in a few seconds without disturbing the others. When the case is filled it appears very little different from an ordinary bound volume.

A BISCUIT FACTORY

BISCUITS are the product of an age which has largely given up cooking for itself and likes to have its ready-cooked food elegantly served in known doses. It might be hard to say whether the demand has created the supply or vice versa. Anyhow, Peak Freans has grown in three quarters of a century from a small factory to what is known as "Biscuit Town," employing 5000 workers in 29 different trades. There are tailors, carpenters, bakers, printers, engineers, a steam laundry, an internal postal service, and a fire brigade, as well as a medical and dental service. All these play some part in the making of such a product as the wholemeal "crispbread" Vita-weat, for example. The wheat is soaked overnight and subjected to a special "gelatinising" cooking process which preserve all the constituents of the fresh grain. This is crushed to a fine pulp between granite rollers; and the other ingredients, chiefly fat, are added in a large hopper. The mass is then rolled into thin sheets which receive a heavy impression of the shape of the biscuits. These are toasted on endless belts passing through long ovens with a carefully regulated temperature. Every batch is weighed and compared with two standard biscuits for colour, there being a different degree of toasting on each side. Each biscuit is therefore of uniform composition, with a known calorific value and a high vitamin B content. They are then packed in containers made and printed in the factory.

The workers are drawn from the surrounding districts, and have to pass as physically sound, first the employment authorities, then the factory's medical officer, and finally the Home Office inspectors; all new workers are vaccinated. Their work is graded from the results of tests in manual dexterity and mental alertness, but misfits are treated sympathetically, and it is rare for a recruit once accepted to be dismissed on account of ill-health or incompetence. The health of the workers is in the charge of the

medical officer, a nurse, and two dentists, equipped with a surgery and dispensary, which is claimed to be one of the first of its kind, for it began in 1908, and a dental surgery. There were 15,000 dressings in 1935, and a record number received dental treatment. More serious conditions are referred to the patient's insurance doctor, but employees not eligible for insurance are treated in their own homes by the factory's medical officer.

A HANDBOOK OF PHOTOGRAPHY

THE photographer who, whilst not finding the need for regular perusal of a weekly journal, yet wishes to keep informed of progress and development in technique, will find the *British Journal Photographic Almanac* a convenient means of doing so. This well-known annual gives brief descriptions of new apparatus and methods of working, and a short section deals with new models of cine-projectors and cameras designed mainly for amateur use. The projectors described vary in price from £75 for a machine suitable for use in a small hall to £17 for one for home use, both being designed for use with 16 mm. film, and from £33 to 37s. 6d. for machines to take the smaller size film, the latter price applying to a hand machine. The descriptions given do not exhaust the models available, and those of our readers to whom this branch of photography appeals will be able to obtain more detailed information from dealers. The formulæ presented in the handbook are as varied and useful as ever and the whole production will be found a valuable work of reference. It is issued at 3s. (cloth) and 2s. (paper) by Henry Greenwood and Co., Ltd., 24, Wellington-street, London, W.C.2.

Appointments

BAKER, A. H. L., L.M.S.S.A. Lond., has been appointed Resident Anaesthetist at the West Middlesex County Hospital.
 COOKSON, C. C., M.B. Birm., Casualty Medical Officer at the West Middlesex County Hospital.
 GILBERT, B., M.D. Lond., F.R.C.S. Eng., M.C.O.G., Registrar and Tutor to the Obstetric Department at St. Thomas's Hospital.
 RIDLEY, N. H. L., M.B. Camb., F.R.C.S. Eng., Registrar to the Ophthalmic Department at St. Thomas's Hospital.
 SEARLE, W. N., M.B. N.Z., F.R.C.S. Edin., M.C.O.G., Registrar and Radium Officer at the Chelsea Hospital for Women.
Royal Masonic Hospital.—The following appointments are announced:—
 CRITCHLEY, MACDONALD, M.D. Brist., F.R.O.P. Lond., Neurological Physician;
 LINDSAY, E. C., M.B. Lond., F.R.C.S. Eng., Surgeon; and
 SHORTER, A. A., M.B. Sydney, Resident Surgical Officer.

Vacancies

For further information refer to the advertisement columns.

Aylesbury, Royal Buckinghamshire Hospital.—Second Res. M.O. £150.
Barnsley Municipal General Hospital.—First Asst. M.O. £650.
Belfast, Royal Victoria Hospital.—Res. Biochemist. At rate of £100.
Belgrave Hospital for Children, Clapham-road, S.W.—Two H.P.'s and one H.S. Each at rate of £100.
Birmingham City, Maternity and Child Welfare Dept.—Three Temp. M.O.'s. Each £10 per week.
Blackburn County Borough.—Asst. M.O.H. and Asst. School M.O. £600.
Bolton Royal Infirmary.—H.S. £125.
Bradford, Royal Infirmary.—H.S. At rate of £135.
Bristol, Ham Green Hospital and Sanatorium.—Jun. Asst. Res. M.O. £250.
British Postgraduate Medical School, Ducane-road, W.—Three H.S.'s.
Buxton, Derbyshire, Devonshire Royal Hospital.—Hon. Asst. Physician.
Cambridge, Addenbrooke's Hospital.—H.P. Also H.S. to Special Depts. Each at rate of £130.
Canterbury, Kent and Canterbury Hospital.—H.S. At rate of £125.
Canterbury, Kent County Mental Hospital, Chartham Down.—Med. Supt. £1000.
Cardiff, King Edward VII. Welsh National Memorial Association.—Res. Asst. Tuber. M.O. £500. Res. M.O. £350. Also Asst. Res. M.O. £200, for Sully Hospital, Glam.
Charing Cross Hospital.—Hon. Clin. Asst. to Dermatological Dept.

Chelsea Hospital for Women, Arthur-street, S.W.—Surgeon for Ear, Nose, and Throat.
Cheshire, Institution for Mental Defectives, Cranage Hall.—Res. Med. Supt. £800.
Chester, East Lancashire Tuberculosis Colony, Barrowmore Hall.—H.P. At rate of £150.
City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.
Derby, Brebly Hall Orthopaedic Hospital, near Burton-on-Trent.—Res. H.S. £150.
Deusbury, Infectious Diseases Hospital.—Res. M.O. £200.
Durham County Council.—Asst. Welfare M.O. £500.
Eastbourne Royal Eye Hospital, Pevensey-road.—H.S. £100.
Elizabeth Garrett Anderson Hospital, 144, Euston-road, N.W.—Hon. Asst. Obstetrician.
Evelina Hospital for Sick Children, Southwark, S.E.—Dental Surgeon. Also H.S. At rate of £120.
Exeter, Royal Devon and Exeter Hospital.—H.S. to Ear, Nose, and Throat Dept. At rate of £150.
Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—Res. Surg. O. £150. Also Asst. Res. M.O. and 3 H.P.'s. At rate of £150 and £50 respectively.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O. Also H.P. At rate of £150 and £100 respectively.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.S. At rate of £75.
Huddersfield Royal Infirmary.—Cas. O. £200.
Iford, King George Hospital.—H.P. and two H.S.'s.
Infants Hospital, Vincent-square, Westminster, S.W.—H.P. At rate of £75.
Isolation Hospital, Muswell Hill.—Res. M.O. £400.
Laboratories of Pathology and Public Health, 6, Harley-street, W.—Third Asst. Pathologist. £450.
Lancaster County Mental Hospital.—Asst. M.O. £500.
Liverpool, Broadgreen Sanatorium.—Res. Asst. M.O. £200.
London County Council.—Two Asst. M.O.'s (Grade I). Each £350. Four Asst. M.O.'s (Grade II). Each £250. Also five Temp. District M.O.'s. £300-£100. Temporary Asst. Aurist. 34s. 6d. a session.
L.C.C. Central Histological Laboratory, Archway Hospital, Archway-road, N.—Asst. Pathologist. £650.
London Lock Hospitals.—Two Res. M.O.'s. One for Male Dept. One for Female Dept. Each at rate of £175.
London (R.F.H.) School of Medicine for Women, 8, Hunter-street, W.C.—Post-graduate Scholarships. Each £200.
Macclesfield General Infirmary.—Second H.S. At rate of £150.
Maidstone, Kent County Ophthalmic and Aural Hospital.—Ophth. H.S. At rate of £200.
Manchester Royal Eye Hospital.—Jun. H.S. £120.
Mount Vernon Hospital, Northwood.—Asst. Radiologist. £350.
Newport, Mon., Royal Gwent Hospital.—Cas. O. At rate of £175.
Paddington Green Children's Hospital, W.—H.P. and H.S. Each at rate of £150.
Port Said, British Hospital.—Principal M.O. £700.
Princess Beatrice Hospital, Earl's Court, S.W.—Hon. Anaesthetist.
Queen Mary's Hospital for the East End, Stratford, E.—Asst. Radiologist. £150. Also Obstet. H.S. £120.
Reading, Royal Berkshire Hospital.—H.P. Also Cas. O. Each at rate of £125.
Redhill, Royal Earlswood Institution.—Jun. Asst. M.O. At rate of £250.
Richmond, Surrey Royal Hospital.—Jun. H.S. At rate of £100.
Rochdale Infirmary and Dispensary.—Second H.S. £150.
Rotherham Hospital.—Cas. H.S. £150.
Rotherham, Oakwood Hall Sanatorium.—Asst. Res. M.O. £250.
Royal Free Hospital, Gray's Inn-road, W.C.—Res. Cas. O. At rate of £150.
Royal National Orthopaedic Hospital, 234, Great Portland-street, W.—H.S. At rate of £150.
Royal Northern Hospital.—Asst. Pathologist. £500.
Royal Waterloo Hospital for Children and Women, S.E.—Hon. Asst. Orthopaedic Surgeon.
St. Mary's Hospital, W.—Med. Reg. £200.
Salford, Hope Hospital.—Res. Obstet. Officer. £400.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. At rate of £100.
Sidmouth U.D.C.—M.O.H. £260.
Southeast-on-Sea General Hospital.—Two H.S.'s. Each at rate of £100.
South Mimms, County (Tuberculosis) Sanatorium, Clare Hall.—Deputy Med. Supt. £400.
Swanley Hospital Convalescent Home, Parkwood.—Res. M.O. At rate of £200.
Torquay, Torbay Hospital.—H.S. £175.
University College Hospital Medical School, W.C.—Jun. Fellows for Beit Memorial Fellowships. Each £400.
Walsall General Hospital.—H.P. and Res. Asst. Pathologist. At rate of £150. Also H.S. £150.
Walsall, Manor Hospital.—Jun. Res. Asst. M.O. £150.
Warrington Infirmary and Dispensary.—Third Resident. At rate of £150.
Warwick, King Edward VII. Memorial Sanatorium, Hertford Hill.—Jun. Asst. M.O. At rate of £250.
Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. and Jun. Res. H.S.'s. At rate of £150 and £100 respectively.
West London Hospital, Hammersmith-road, W.—Physician.
Wigan, Royal Albert Edward Infirmary and Dispensary.—Res. Med. and Surg. O. and Reg. £250. Also H.S. At rate of £150.
Willesden General Hospital, Harlesden-road, N.W.—Hon. Anaesthetist.
Wrexham and East Denbighshire War Memorial Hospital.—Res. H.S. At rate of £150.
Yorkshire Children's Orthopaedic Hospital, Kirbymoorside.—H.S. £200.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Knottingley and Hoyland Nether (Yorks, W.R.); and Stirling (Stirling).

ADDRESSES AND ORIGINAL ARTICLES

ON CERTAIN SEPTICÆMIAS
DUE TO ANAEROBIC ORGANISMS *

By A. LEMIERRE, M.D.

PROFESSOR OF BACTERIOLOGY IN THE FACULTY OF MEDICINE,
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THE septicæmias dealt with in this address arise from several species of anaerobic organisms which are specifically distinct from one another but which possess the common character of living as saprophytes in the natural cavities of the human body, mouth, pharynx, intestine, and genito-urinary passages; they are fragile, very slightly motile, and grow sparsely on culture media. To this group of organisms belong those Gram-negative and non-spore bearing bacilli which certain bacteriologists group together under the name of "bacteroides"; their rôle in the production of non-traumatic gangrene has been described in France by Veillon, Zuber, Rist, Guillemot, and Hallé. With them must also be placed certain Gram-positive anaerobic micrococci, streptococci, and staphylococci, which have been variously named by the different authors describing them.

These septicæmias arise from inflammatory or suppurative lesions in the tissues or cavities where the above-mentioned anaerobic organisms exist under physiological conditions. Having proliferated in these localities they pass into the blood stream and frequently give rise to septic emboli in distant areas. Such septicæmias tend to arise—

- (1) From inflammatory lesions of the nasopharynx, particularly tonsillar and peritonsillar abscesses.
- (2) From similar lesions of the mouth and jaws.
- (3) In connexion with otitis media or mastoiditis.
- (4) From purulent endometritis following parturition.
- (5) From appendicitis.
- (6) From infections of the urinary passages.

But whatever their origin, they present certain common clinical aspects which enable them to be grouped together. For that reason, as typical of the group as a whole, the post-anginal septicæmias will be first described, and in later portions of this paper attention will be directed to the clinical and pathological similarity between such post-anginal septicæmias and those which arise from other sites.

The post-anginal septicæmias due to anaerobic organisms most frequently seen in Paris are due particularly to the *Bacillus funduliformis*, described in 1898 by Jean Hallé, which can usually be isolated in pure culture from the blood and from secondary abscesses; it is sometimes associated with an anaerobic streptococcus. The first cases of septicæmia from this cause were described in 1929 and 1931 by Prof. Pierre Teissier and his collaborators Jean Reilly, Rivalier, Layani, and Stefanescu; later similar observations were published by the writer with Jean Reilly, Layani, Friedman, and André Meyer, by Cathala, Bourgeois, and Gabriel, by Jame and Jaulmes, and by P. de Font-Réaulx. In 1935 Pham Huu-Chi published a considerable work on this subject.

In Germany, where Schottmüller must be given the credit of being the first to describe them in 1918, the importance of the anaerobic post-anginal septicæmias has been emphasised by a number of

physicians, including Buigold, Fränkel, Claus, and Kissling. The name given by them to the usual causal organism of such septicæmias is *Bacillus symbiophiles*, and they state that it is usually associated with an anaerobic streptococcus. The present uncertainty concerning the classification of anaerobic organisms and the diversity of bacteriological tests employed by different observers to identify them make it possible that *B. funduliformis* and *B. symbiophiles* are either identical or else belong to very similar species of bacteria. In any case the description which the German authorities give of the post-anginal septicæmias corresponds feature by feature to what the present writer has observed.

Clinical Picture

The disease usually affects young adults or adolescents, both sexes being equally attacked. Claus and Kissling have observed that sometimes small epidemics occur, a fact which I can confirm. The most usual initial cause is a tonsillar or peritonsillar abscess, opened too late or to an insufficient degree. At times what appears to be a simple tonsillitis may conceal small foci of suppuration in the depths of the tissues which cannot be demonstrated clinically; an example of this was recently under my observation at the Claude Bernard Hospital in Paris.

Since the original work of E. Fränkel in 1919 German authorities have considered that these septicæmias are the result of a thrombophlebitis of the tonsillar and peritonsillar veins which can spread to the internal jugular vein or even to the facial vein. My own observations agree with this conception.

The first symptom of septicæmia complicating the pharyngeal inflammation is a notable rise of temperature to 101° or 103° F., accompanied by an intense rigor. The rigor usually occurs on the fourth or fifth day after the beginning of the sore-throat, occasionally as late as the eighth, tenth, or even twelfth day, by which time the tonsillar inflammation appears to be cured and the initial fever has disappeared. After this rigors are repeated daily, several times per day, or at more remote intervals. In the gravest cases the temperature remains in the region of 100° to 103° with exacerbations corresponding to the rigors; in milder and more chronic cases the pyrexia is hectic and irregular.

There is usually painful swelling of the glands below the maxillary angle usually on one side only, occasionally on both; there is slight local œdema and tenderness on pressure and on movement of the head; this occurs on the lateral aspects of the neck, parallel to the sternomastoid muscle, and extends from the angle of the jaw to the clavicle; suppuration sometimes occurs at this site.

The *B. funduliformis* septicæmias observed by myself have never been pure septicæmias, they have always been accompanied by the formation of distant metastatic abscesses. Amongst such secondary localisations the most frequent are those in the lungs. They occur early and may be present from the first day. They are in the nature of septic infarcts leading almost invariably to multiple abscess formation which is announced by intense thoracic pain of sudden onset, by dyspnoea, sometimes by blood-stained or rusty sputum, by pleural frictions, and by localised areas of subcrepitant râles. Very frequently these pulmonary infarcts are complicated by purulent pleural effusions containing *B. funduliformis*, but in

* An address delivered on March 3rd, 1936, at the Middlesex Hospital Medical School.
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rare cases such effusions may be serofibrinous and aseptic. These purulent effusions occasionally open spontaneously into a bronchus, giving rise to a pyopneumothorax.

Articular lesions are also extremely frequent; they range from simple pains in the joints, sometimes of great severity, to suppurative arthritis occurring especially in the shoulders, elbows, knees, sternoclavicular or sacroiliac articulations.

Icterus and subicterus have often been noted and urobilin is invariably present in considerable quantities in the urine.

Renal lesions are manifested by albuminuria, sometimes accompanied by a slight or considerable increase in the blood-urea. I have also had occasion to observe thyroiditis, suppurative peritonitis, abscess formation in the psoas muscle or in the deep muscles of the buttock originating from sacroiliac arthritis. During the course of the disease there is usually a leucocytosis ranging from 13,000 to 30,000 white cells and in the more chronic cases the red cells are sometimes reduced to 2 or 3 millions.

These septicæmias may progress rapidly and end fatally in from 7 to 15 days; in such cases the temperature remains constantly high, the patient is in a state of extreme prostration with the aspect of a case of typhus, and dies in coma. In other cases the repeated recurrence of attacks of extreme high temperature may in a few days bring about fatal collapse. Again the fatal termination may be delayed to the end of the third week, or even a month or six weeks may pass before it occurs. In such examples the temperature becomes irregular and oscillating; in accordance with the recurrence of excessive febrile attacks one sees the usual phenomena appear; pulmonary infarcts, pleural effusions, and arthritic phenomena; the patient wastes, the colour becomes pale and earthy, and there are profuse sweats; finally delirium occurs and death follows in a condition of cachexia. It may be hastened by the sudden bursting of an abscess into the bronchus followed by syncope.

Diagnosis

The most characteristic lesions found at autopsy are those in the respiratory tract. The lungs are the site of necrotic infarcts, both centrally and peripherally, usually about the size of a pigeon's egg and circumscribed. Some are seen as yellow masses surrounded by a hæmorrhagic zone, others in the form of cavities containing pus. From these lesions *B. funduliformis* can usually be recovered in pure culture, but occasionally it is associated with an anaerobic streptococcus. In a case recorded by Prof. Tessier and his co-workers, which was accompanied by deep jaundice and purpura, the liver was greatly enlarged and was studded with necrotic abscesses from which the organism was isolated in pure state.

From this it is clear that these septicæmias carry an extremely grave prognosis. Of the 20 cases observed by the writer and certain of his colleagues in Paris only two have recovered. These two were, however, amongst those appearing most ill and were complicated by pulmonary and arthritic manifestations; further, the number of organisms in the blood, estimated after the examinations of cultures, appeared as great in these as in the fatal cases. In these survivors cure occurred spontaneously and treatment had been of purely symptomatic character.

It is therefore understandable that certain German observers have been led, as soon as the clinical diagnosis was possible, and without awaiting the

results of bacteriological examination, to perform ligation of the internal jugular vein on the side of the affected tonsil. They claim that thanks to this intervention the mortality has been diminished. I have personally had recourse to this treatment in a recent case but unhappily without success in preventing a fatal termination.

To anyone instructed as to the nature of these septicæmias it becomes relatively easy to make a diagnosis on the simple clinical findings. The appearance and repetition several days after the onset of a sore-throat (and particularly of a tonsillar abscess) of severe pyrexial attacks with an initial rigor, or still more certainly the occurrence of pulmonary infarcts and arthritic manifestations, constitute a syndrome so characteristic that mistake is almost impossible.

Certain diagnosis is established by bacteriological examination. *B. funduliformis* is easy to discover in the purulent effusions, but it is blood culture on anaerobic media which gives the earliest definite information, and this is particularly sure if the blood is taken during a rigor.

The culture medium employed at the Claude Bernard Hospital by J. Reilly, which can be particularly recommended, consists of 10 c.cm. of the glucose agar of Veillon to which is added 40 c.cm. of peptonised bouillon and 2 c.cm. of a 20 per cent. solution of glucose. This medium divided in glass tubes 25 cm. long and 25 mm. wide, is liquefied by heat at the moment of employment and kept at a temperature of 40°C. After 2 to 4 c.cm. of blood have been added the tubes are immediately cooled under the tap. The colonies appear in it after two to four days' incubation at 37°.

B. funduliformis in pus smears appears in the form of a fine bacillus of 2 to 3 μ in length, Gram-negative, and exhibiting at each end a well-coloured mass, whilst the centre of the microbe remains clear. In cultures it presents, and this is a very important point, a remarkable polymorphic appearance. It occurs in preparations simultaneously as a fine bacillus, as long filaments, more or less voluminous, and sometimes as spherical elements. Some of these spherical bodies, of a diameter of about 2 to 4 μ , are intensely susceptible to basic stains. Others achieve greater dimensions, as much as 12 to 14 μ . Their protoplasm is clear but they contain coloured nuclei of various shapes sometimes resembling the nuclei of polynuclear leucocytes. The spherical elements are quite characteristic and permit absolute identification of *B. funduliformis*. The polymorphic character of the microbe elements may be observed in the first cultures obtained from the blood but is much more obvious in subcultures. In individual cases sometimes the forms with filaments and sometimes the spherical forms predominate.

One further characteristic of the bacillus may be mentioned—namely, that it is constantly hæmolytic. Finally, J. Reilly has demonstrated that, on injection of cultures into the rabbit, septicæmia with metastatic abscess formation in the lungs, liver, and joints, exactly comparable to what is seen in man, is produced.

Various Sites of Infection

THROAT AND EAR

The *B. funduliformis* is the commonest pathogenic agent in post-anginal septicæmias such as have been described above. But other bacilli of the same group may also be the causal agents. Allusion has already been made to the *B. symbiophiles* of Schottmüller; recently Grumbach and Verdan (of Zürich) have in three instances found in the blood a "fuso-bacterium nucleatum" which is perhaps identical with *B. funduliformis*. There is, on the other hand, an anaerobic organism very definitely distinct from *B. funduliformis*—namely, *B. fragilis*—which is occasionally

responsible, as the present writer, with Guy and Rudolph, has demonstrated; a similar infection has been observed by Richon, Kissel, and Lepoire.

The infections described above are marked by rigors and embolic phenomena, but it occasionally happens that somewhat similar fevers are observed which get well without any such complications although blood culture has revealed anaerobic organisms; we have, for example, observed cases of this sort from which *B. ramosus* has been recovered and another due to an anaerobic staphylococcus. Such cases are exceptional and are not due to a true septicæmia but to simple momentary and benign bacteræmia. These observations are nevertheless instructive; the transient discharge of organisms into the blood stream during a pharyngeal infection is certainly capable, occasionally, of producing embolic phenomena which may take on the appearance of a local disease in which the original cause is not clear. Such septic emboli may be the origin of certain cases of pulmonary suppuration or of empyema or arthritis, clinically resembling that which has been described in this paper but of lesser gravity because a true septicæmia is not present.

On the other hand, the reason why the complications heretofore described have been straightforward suppuration, but not of a putrefactive character, is that they have been due to pure infection by *B. funduliformis* or at most to this organism associated with an anaerobic streptococcus. The fœtid pus of tonsillar abscesses contains many species of anaerobic organisms, and it is surprising that only one or two of them usually pass into the blood stream. It does, however, occasionally occur that others of these anaerobes may take this course and give rise to septicæmias of mixed origin with putrid embolic foci. I have, for example, described with P. de Font-Réaulx, a case with the usual blood picture but complicated by gangrenous osteoperibstitis of the pubis and gangrenous pulmonary abscesses containing many different species of anaerobic organisms.

The description given of the post-anginal septicæmias is sufficient to allow review of those arising from other primary foci to be very brief. Such are observed in the course of otitis and mastoiditis particularly when fœtid otorrhœa has been present, such fœtor being due to infection with anaerobes. Otitis of this type is very frequently complicated by lateral sinus thrombosis and is the cause of pulmonary emboli.

Anaerobic septicæmia arising from otitis and proved by blood culture has been described particularly by Guillemot (*B. fragilis* and *B. radiiformis*), by Boez, Keller, and Kehlstadt (*B. fragilis*), by Boez, Keller, and Schreiber (*B. ramosus*), by Langeron (anaerobic staphylococcus), and by Franklin and Camb (Gram-negative *B. fusiformis*).

The clinical manifestations of such septicæmias are very closely similar to the picture given of the post-anginal septicæmias. The same picture has been observed by us in connexion with buccal suppuration following the extraction of heavily infected teeth.

UTERUS AND PELVIC ORGANS

Anaerobic septicæmias are well known as complications of postpartum uterine sepsis. The clinical similarity of these to the post-anginal septicæmias has recently been emphasised by A. Schneider. The normal presence of *B. funduliformis* and other anaerobic organisms in the vagina was noted in 1898 by J. Hallé, and in 1902 Jeannin called attention to the proliferation of these anaerobes in the uterine cavity after any severe case of suppurative puerperal endometritis.

In a series of publications since 1910, Schottmüller has given a full description of these septicæmias which are always linked with the presence of peri-uterine thrombophlebitis; fever, repeated rigors, pulmonary metastases, and occasional icterus are the outstanding clinical features. He gives as the commonest cause an anaerobic streptococcus, the *Streptococcus putridus*, which may be associated with other organisms including the *B. symbiophiles*. Similar cases have been observed by myself and by Boez, Keller, and Kehlstadt. In the uterine septicæmias, as in the post-anginal ones, the metastatic abscesses are only fœtid when the infection includes a number of different species of anaerobes.

It has further been noted that similar phenomena may occur after surgical operations on the uterus and pelvic organs, and that apart from septicæmia a simple bacteræmia may occur producing distant abscesses the primary focus of which may be overlooked.

OTHER LOCI

Gangrenous appendicitis is known to arise frequently from anaerobic infections; such cases are sometimes complicated by thrombophlebitis of the mesenteric veins, by pyelphlebitis, by liver abscess, and by fœtid subphrenic abscess. In such cases Schottmüller has isolated from the blood streptococci, anaerobic staphylococci, and the *B. symbiophiles*. Nedelmann has recently isolated the last-named from such a case in pure culture. The site of the thrombophlebitis in such cases prohibits the formation of pulmonary infarcts, but gangrene of the lung and purulent pleurisy are occasional complications. The usual high fever and rigors characterise such cases.

In 1899 Cottet noted the presence of organisms of this type, notably *B. funduliformis*, in certain cases of peri-urethral suppuration. Thomson and Beaver have reported a case of septicæmia due to *B. fragilis* in a patient suffering from cancer of the bladder, and another of septicæmia due to *B. funduliformis* following prostatectomy, this last case being complicated by iliac phlebitis and pulmonary metastases.

Summary

No attempt has been made to review completely the literature of the subject, but sufficient has been said to demonstrate that, whatever their primary focus, the septicæmias produced by the anaerobic organisms which occur as saprophytes in the natural cavities of the human body display remarkable clinical similarities. They commence by suppuration in the local site and this is followed by local thrombophlebitis. Considerable fever and intense rigors are the next feature, and these are followed very frequently by septic pulmonary emboli. The syndrome is so characteristic that it permits of diagnosis before bacteriological examination, including blood culture, has provided conclusive proof. The post-anginal septicæmias due to *B. funduliformis* have been specially described, but the same phenomena are observed when such septicæmias of anaerobic origin arise from other initial causes.

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MEDICAL PROBLEMS IN MINERAL METABOLISM*

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II.—SODIUM DEFICIENCIES IN CLINICAL MEDICINE

The Body Fluids

At the outset of this lecture I wish to say something of the formation and composition of the body fluids, a number of which are set out in diagrammatic fashion in the accompanying Figure. The upper half of each rectangle represents, in milli-equivalents per litre, the concentrations of the bases in that fluid, and the lower half indicates the concentrations of the acids. For any given fluid the two must obviously be equal. It will be noticed that the composition of the cell fluid differs radically from that of all extracellular fluids, for the former contains chiefly potassium phosphate whereas the latter characteristically contain sodium chloride and bicarbonate. There is practically no interchange of basic ions between the cells and the fluids surrounding them.

The substances dissolved in these fluids cause them to have a considerable osmotic pressure which amounts to about 8 atmospheres.²⁶⁷ The pressure is due (a) to the non-electrolytes. In man these contribute only a small quota to the total osmotic pressure and are not indicated in the diagram. They are, generally speaking, equally distributed between cells and plasma, and so merely raise or lower the general level of osmotic pressure of the whole body without affecting the water distribution between the cells and plasma. In the dogfish non-electrolytes are present throughout the body in large amounts and so raise its osmotic pressure above that of the surrounding sea water. We were chiefly concerned with this total osmotic pressure of the body in the discussion of the water regulation of the marine fish (Lecture I.). (b) To the electrolytes. These consist of the inorganic and organic (protein) ions, but the inorganic ions give rise to nearly the whole of the electrolytic osmotic pressure. The protein ions contribute so little towards it that they may almost be neglected, and therefore the electrolytic osmotic pressure taken to be the sum of the osmotic pressures due to the inorganic basic and acidic ions. Since the basic ions of the extracellular and cellular fluids are not interchangeable, their concentrations control the electrolytic osmotic pressure of their respective fluids, and hence the water distribution between the cells and plasma. It is the electrolytic rather than the total osmotic pressure with which we are chiefly concerned in man.

The rectangles in the diagram are not all of the same length. The greater length of some of them (serum, cell fluid, semen, and bile) is due to the proteins or colloidal bile acids which they contain, and does not indicate a greater osmotic pressure.²⁶² Actually the total osmotic pressure of the serum, the other internal extracellular fluids, and of the cells are all the same. This is an important point, and indeed it is fairly certain that no fluid could remain

long in contact with the internal body cells without coming into osmotic equilibrium with them by the passage of water in one direction or the other. Even the bile in the gall-bladder, which may contain much more sodium than the serum,⁹⁰ seems to have the same osmotic pressure as the other body fluids.²⁶⁴ There is practically no protein in any of the secreted fluids, and the short rectangles (saliva and sweat) indicate real differences of osmotic pressure. These fluids which are secreted on to an impermeable stratified epithelium need not have the same osmotic pressure as the internal fluids.

With two exceptions sodium forms about 94 per cent. of the total base of the extracellular fluids. The first exception is the gastric juice, where, as is well known, hydrogen forms between 60 and 70 per cent. of the total base. The second exception is the semen, in which potassium forms 17 per cent. of the total base instead of the usual 3 per cent. The two important acid radicles of serum, oedema, cerebro-spinal fluids, and of the gastro-intestinal secretions are chlorides and bicarbonates, but they differ very greatly in their relative concentrations, and it is these differences which impart some of the peculiar characteristics to each fluid. Semen has a most interesting and unusual composition for an extracellular fluid, for it contains a large amount of phosphoric acid. The main acid radicle of sweat is chloride, but some bicarbonate, lactate, and other ions are also present.

A glance at the diagram is sufficient to show that, although the gastro-intestinal fluids and semen have the same osmotic pressure as the serum,^{99 100 101} they are true secretions in that their ionic pattern is

TABLE I

Composition of Serum, Serum Ultrafiltrates, Effusions, and Cerebro-spinal Fluid
Mg. per 100 c.cm.

	Serum.	Serum ultrafiltrate.	Effusion.	C.S.F.
Sodium ..	330	334	334	334
Potassium ..	17	18	17.5	10.6
Calcium ..	10.3	5.54	5.9	5.33
Magnesium ..	2.5	1.8	—	3.3
Chloride ..	365	387	390	436
Bicarbonate ..	151	—	150	105
Phosphorus ..	3	3.0	3	1.8
Sulphur ..	1.9	2.0	2.2	0.6

Sources of Information

Sodium: 62 97 167 255
Potassium: 39 97 167 177 179 191 334
Calcium: 41 59 70 73 125 166 176 179 189 191 226 232 235 255 265 285
298 300 303 332
Magnesium: 51 97 166 189 190 191 300 333
Chloride: 97 151 231 255 317
Bicarbonate: 54 75 97 125 231
Phosphorus: 73 97 125 166 179 255 301
Sulphur: 335 General: 82 97 166

different. The same is true of saliva and sweat, which differ obviously from serum not only in composition but also in osmotic pressure. It is impossible to draw any accurate conclusions about the cerebro-spinal fluid from the rough diagram shown here,³ but its composition, together with that of serum, serum ultrafiltrates, and oedema fluids, is set out in Table I. The osmotic pressure of serum and cerebro-spinal fluid is the same.⁸⁶ The relative concentrations of²⁶

*The Goulstonian lectures for 1936, delivered before the Royal College of Physicians of London on March 5th, 10th, and 12th. Lecture I. was published on March 21st; the remainder of Lecture II. and Lecture III. will appear in forthcoming issues.

TABLE II
Average Volumes of Digestive Fluids Secreted by an Adult Man in 24 Hours
(After Rowntree²⁷³)

Secretion.	Volume c.cm. in 24 hours.	Authority.
Saliva	1500	Bidder and Schmidt.
Gastric juices	2000-3000.	
Bile	300-500	Pfaff and Balch.
Pancreatic juice	500-800	Wohlgemuth.
Succus entericus	3000	Pregl.
Approximate total	8000	—

magnesium, potassium, chloride, bicarbonate, phosphate, and sulphate in effusions, ultrafiltrates, and cerebro-spinal fluid show however that while effusions and oedema fluids are probably formed by simple ultrafiltration, the cerebro-spinal fluid is a secretion. If further evidence were required, it has been shown that large pathological variations in the serum calcium are not reflected in the cerebro-spinal fluid.^{95 106 144 216 326 332} I have, for example, recently seen two cases of severe long drawn out tetany, in which the sera contained 5.81 and 3.78 mg. of calcium per 100 c.cm. The cerebro-spinal fluids contained 5.07 and 4.36 mg. per 100 c.cm. respectively—normal amounts, and one of them actually higher than the corresponding serum.¹⁸⁷ Again, induced changes in the plasma bicarbonate only appear in the cerebro-spinal fluid if the meninges are inflamed.³¹⁸ Non-electrolytes have not the distribution between the two fluids that one would expect were the cerebro-spinal fluid an ultrafiltrate.^{46 50 60 75 266 278 327}

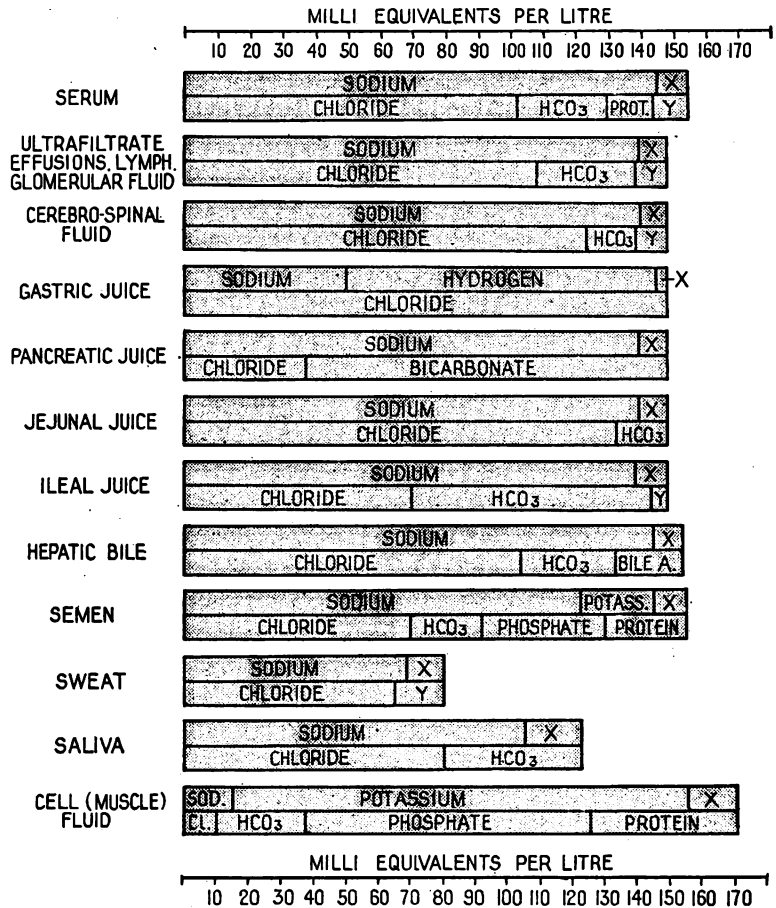
The concentration of magnesium¹⁹⁰ and possibly of chlorides^{178 181} has been found to fall in tuberculous meningitis with no corresponding change in the serum. Lastly, the way in which the flow of cerebro-spinal fluid responds to changes of oxygen and CO₂ tension strongly suggests secretion rather than filtration.²³⁶ I have perhaps over-stressed the way in which the cerebro-spinal fluid is formed, but it is not generally appreciated in this country and I think it is helpful to bring this fluid into line with others which are secreted into the body spaces.

The volume of blood in an adult's body may be taken roughly to be about 5 litres, of which say 2.5 are plasma. From this plasma all the extracellular secretions of the body are derived, and the volume of these is very large. Table II., which is copied from Rowntree²⁷³ and McQuarrie,¹⁹⁸ gives an indication of the large volumes of digestive juices which may be secreted by an adult man in 24 hours. I do not, however, think these figures unreasonably large, for Katsch and Mellinghoff^{167 215} have

obtained figures of the same order from patients from whom continuous removal of gastric juice was being practised for therapeutic reasons. It is obvious that secretion into the gut at this rate is only made possible by an equally rapid reabsorption at a lower level, and that the continuous loss of any one of the gastro-intestinal fluids must have very serious consequences because of the loss of sodium and water which it entails. I wish now to consider this subject in more detail, with special reference to the resulting sodium deficiencies.

Forced Loss of the Extracellular Fluids

(a) *Loss of the intestinal secretions.*—This is a common cause of sodium deficiency and water loss which operates in continuous vomiting,^{218 219 263 312} particularly in pregnancy,^{68 113 126 127 163 168 247 284 325} or the so-called cyclical vomiting of children,^{20 140 165} pyloric stenosis^{36 148 230 246 260} and intestinal obstruction,^{114 117 168 202 203 214 240 258} gastro-enteritis, diarrhoea and cholera,^{176 217 260 269 270 281 282 286 287} and especially perhaps in the acute diarrhoea and vomiting of children.^{45 52 131} A typical sodium chloride



Composition of the body fluids : X = unnamed basic radicals.
Y = " " acidic "

Sources of Information

- Serum : 138, &c.
- Cerebro-spinal fluid, exudates, ultrafiltrates, and glomerular fluids : see Table I., also 81 92 95 96 228 233 327 328
- Gastric and pancreatic juices, bile : 89 90
- Jejunal juice : 16 145 150
- Ileal juice : 16
- Semen : 104 187 192
- Sweat : 187 200 201 227 239 340
- Saliva : 17 49 137

deficiency has been produced by draining a gall-bladder which contained a salt-secreting papilloma.¹⁶² Our present knowledge of the subject is the result of a great deal of research and investigation commencing over one hundred years ago into the nature of the fluids lost and the resulting acid-base-water balance of the organism.^{241 242 286 287} Intestinal obstruction, 7 10 58 79 84 91 92 107 111 112 115 116 118 119 120 121 122 142 152 186 305 331 336 337 339 the continuous loss of gastric, 4 64 72 89 107 136 157 180 215 329 341 pancreatic,^{64 77 90 136} duodenal, 34 89 90 330 and intestinal juices^{16 145 150} have all been experimentally produced and the blood chemistry fully investigated. The subject has been reviewed by a number of writers.^{35 58 88 94 168 196 204 283 339}

(b) *Loss of sweat.*—This is not nearly such a common cause of sodium chloride deficiency in this country, but it may give rise to unrecognised ill-health in hot climates,^{193 194} and may be most serious^{164 195 314} or fatal. Some remarkable escapes have been recorded.¹⁹⁵ Sweating is an essential step in the production of stoker's or miner's cramp,^{67 229} and some aspects of the subject have been investigated experimentally in man.^{15 30 69 170 200 201 209 229 313 340} Small laboratory animals do not sweat. The horse does, freely, but I am not aware of any experiments on this animal.

(c) *Loss of other extracellular fluids.*—Porges and Mach have described an unusual cause of salt deficiency—namely, repeated tapping of collections of ascitic fluid in a patient who was on a low salt diet. This must be rare, but a similar method has been employed experimentally.^{63 98 161 245 291 344} Large injections of a glucose solution were made into the peritoneal cavity. The injected fluid rapidly came into equilibrium with the plasma electrolytes. By tapping the abdomen after this had taken place and before the fluid was absorbed a large part of the body's extracellular ions was removed.

Changes in the Blood and Cells Caused by the Loss of the Extracellular Fluids

Let us once more consider for a moment the composition of the body fluids and consider what will be the effect of their removal upon the fluids left behind. Take, for example, a mixture of the jejunal and ileal juices and let us suppose that 500 c.cm. have been secreted and removed from 2500 c.cm. of plasma. The mixed juices resemble plasma in composition (see Figure) except that they contain less protein, and we may consider for this purpose that 500 c.cm. of protein-free plasma have been removed. The results will be (a) a reduction in plasma volume from 2500 to 2000 c.cm.; (b) a reduction in the blood volume from say 5000 c.cm. to 4500 c.cm. and a corresponding rise in the cell count; (c) a concentration of the plasma proteins by 20 per cent. and a rise therefore in the colloidal osmotic pressure; (d) no change in the concentration of serum electrolytes—i.e., little or no change in the total osmotic pressure.

The removal of a similar volume of pancreatic juice would have brought about the same haemoco-concentration, but in other ways the results would have been different, for much more bicarbonate than chloride would have been removed. An excess of the latter therefore would have been left behind and this would have led to an acidosis. With the removal of gastric juice a still further complication would be introduced, for this juice is not only acid but contains far less sodium and more chloride than the plasma. The removal of 500 c.cm., therefore, would leave the remaining 2000 c.cm. of plasma with a deficiency of chloride but with an excess of sodium. This would

make the plasma hypertonic, but this might not be appreciable because water would move in compensation from the cells to the plasma. There would, however, be an alkalosis. 500 c.cm. of sweat contain very much less sodium chloride and bicarbonate than a similar amount of plasma. It is obvious that their removal from 2500 c.cm. of plasma would raise the concentration of sodium salts in the remaining 2000 c.cm.

In practice the removal of 500 c.cm. of one of the extracellular fluids would not greatly alter the composition of the plasma, for there are small accumulations of extracellular fluid in various parts of the body which may be drawn upon to maintain the composition of the plasma relatively unaltered. Indeed, the total amount of extracellular fluids in the body is thought to be as much as 20 per cent. of the body-weight.^{63 173} Moreover, changes in the acid-base balance may be masked by the kidney, which always tends to counteract such abnormalities. Further, water may be taken by mouth and some or all of it absorbed. After moderate loss of gastric juice or sweat this is wholly beneficial, for the water is used to restore the hypertonic plasma to normal and at the same time to make up the plasma volume. When water is absorbed after large amounts of other body fluids have been lost, or if the loss of base (however brought about) has been sufficiently severe, the osmotic pressure of the plasma is no longer strictly maintained. A compromise is struck between the volume of the plasma and its osmotic pressure,

TABLE III

	Red blood-cells (mil./c.mm.).	Plasma proteins (per cent.).	Blood vol. (c.-cm.).	Serum Na. (mg./100 c.cm.).	Serum Cl. (mg./100 c.cm.).	Alkali reserve (vol. per cent.).	Blood-urea (mg./100 c.cm.).	Acid-base balance.
Normal ..	5.0	7.0	5000	330	370	60	30	Normal.
Pyloric stenosis	5.5	7.6	4500	315	300	90	50	Alkalosis.
Diarrhoea (severe)	6.0	8.2	4000	300	330	15	120	Acidosis.
Intestinal obstruction ..	5.8	7.3	4200	290	320	40	80	Generally normal.
Sweating without drinking	8.0	9.0	3800	380	410	70	80	
Sweating with drinking (see Lecture III.)	6.5	7.9	4200	290	322	59	70	

so that we find them both to be reduced. In clinical medicine, and experimental work dealing with intestinal obstruction, the matter is further complicated by the fact that mixed secretions are often lost, so that the final blood picture may be more or less confused. Table III. shows the sort of changes that we might expect to find clinically in the blood. The figures, which are shown in relation to a standard normal, were not taken from particular instances but compiled from the literature and correspond to the textbook disease rather than the bedside case. It must be emphasised that the normal itself is some variation, and that patients may have secondary anaemia or a subnormal protein concentration in their plasma before the onset of acute intestinal disaster. Disregarding these complications it will be observed—

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(a) That there is always a reduction of blood volume. This is of course entirely due to a reduction in plasma volume which is also reflected in—

volume. This is of course entirely due to a reduction in plasma volume which is also reflected in—

(b) the rise of the red cell count and

(c) the rise in the plasma proteins.

(d) There is a fall in the serum sodium, except when sweating has been severe and water has not been taken by mouth. It is not invariable in pyloric stenosis, for reasons which I have just given, but usual. In assessing the total loss of sodium from the body, both the reduction in the extracellular fluid volume and in the concentration of sodium in these fluids must be considered.

(e) There is a fall of chloride and rise of bicarbonate in pyloric stenosis due to the loss of hydrochloric acid in the vomit. In diarrhoea, in which the alkaline pancreatic juices are lost, the fall in bicarbonate exceeds the fall in chloride.

(f) In intestinal obstruction there may be a simultaneous loss of pancreatic and gastric juices so that there may be little or no change in the acid-base balance of the plasma.

(g) A rise in the blood-urea always accompanies these changes. This will be referred to later.

Since the osmotic pressure of the cells is always close to that of the plasma, you will appreciate that these departures from the normal electrolyte pattern of the plasma must affect the cells. A rise or fall in the concentration of sodium alters the electrolytic osmotic pressure of the plasma, and the cells of the solid tissue conform to this by varying their water content. They do not lose potassium^{224 248} or take up sodium. The red blood-cells of man behave like the tissue cells. The erythrocytes of the dog, on the other hand, which contain sodium but not potassium respond to osmotic changes in their environment by changing their base rather than their water content.²⁴⁴

The Chemical Pathology of Addison's Disease

I turn now to other causes of sodium and water deficiency and say something of Addison's disease. Clinically, the progressive destruction of the suprarenal is accompanied by widespread symptoms and signs,^{129 274 275 292} but notably by a low blood pressure, wasting, asthenia, pigmentation, urea retention, anorexia, and often vomiting. The serum sodium is abnormally low, but this is not the result of the vomiting. The chemical pathology of this disease has been enormously advanced by the experimental suprarenalectomies which have been carried out extensively on rats, cats, and dogs in the last few years. Blood pressures have been found to fall in rats⁷⁴ and dogs,^{245 311} and the animals become very weak and die before long unless treatment is administered. The blood changes have been studied^{13 14 37 38 183 185 208 291 305 308 320 345 346} on numerous occasions, and it has been established that the blood volumes fall and the red cell counts increase. Polycythæmia is not a feature of the clinical disease because it may be obscured by a secondary anæmia,^{274 275} or a compensatory reduction of red cells.^{128 211} The disease is so chronic that there is ample time for such secondary adjustments to take place. The hæmoglobin, however, has been observed to fall with the administration of sodium chloride and to rise again when salt was withheld.¹⁴⁹ The serum proteins rise,^{185 308} but curiously enough Silvette and Britton²⁹¹ did not find this in cats and I think the matter should be further investigated. The only patient with Addison's disease whose serum I have had the opportunity of examining had over 7 per cent. of serum proteins. This is normal, but in my experience it is higher than one would expect in a chronic wasting disease. The explanation is to be found in the work of Greene et al.¹⁰⁸ on the clinical disease. These authors have found that the serum proteins may be normal when the patients are in good condition, but that in the periods of crisis they are raised. All are agreed that after bilateral suprarenalectomy the serum

sodium falls and with it the chloride^{185 345} and, to some extent, the alkali reserve.¹⁸³ These changes reduce the electrolytic osmotic pressure of the plasma. Hence the normal distribution of water between the cells and plasma is upset, for the muscles, which do not lose their electrolytes, take up water^{289 290} till osmotic equilibrium is restored. Marañon and Collazo²⁰⁸ have not confirmed this over-hydration of the muscles on clinical material, but their evidence on this point is unsatisfactory because it is not clear how they obtained their controls. The blood-sugar falls,^{37 38 289} the serum potassium rises,^{208 320 346} and there may be some interference with the absorption of fat from the intestine.^{323 324} The blood-urea rises. It will be seen that the changes in plasma volume, blood volume, cell count, serum sodium, chloride and urea are the same as those which occur when sweating is severe and accompanied by the ingestion of large amounts of water—i.e., in sodium chloride deficiency without water deprivation (Table III.)—and the primary cause I consider to be the same—namely, the loss of sodium¹⁸² (see Lecture III.). This is entirely supported by the beneficial effects of sodium chloride in the treatment of the experimental^{13 93 128 210 271 276 310} and clinical disease.^{22 149} The sodium appears to be the controlling ion,²¹⁰ and indeed Blankenhorn and Hayman have claimed that a mixture of sodium sulphate, phosphate, and bicarbonate was as effective as sodium chloride for 17 days in maintaining the health of a patient. This requires confirmation, as remissions are common enough in Addison's disease, and sodium sulphate and phosphate are not very efficacious in sodium deficiencies of intestinal origin.

In the absence of any over-activity of the sweat glands or any obvious loss of the bodily secretions, one naturally turns to the urine in search of the channel through which the sodium is lost. Increased excretion has been demonstrated, and the simplest if not the most "intelligent"²⁴⁸ view to adopt is that in the absence of cortical hormone the renal threshold for sodium falls. Sodium salts therefore are excreted in excessive amounts even when the plasma levels are normal or subnormal. In the absence of an exaggerated intake this must inevitably lead to a sodium deficiency.

Diabetic Coma and Chronic Interstitial Nephritis

There is one other clinical cause of sodium deficiency, but I have left it to the end because it is, I think, the most difficult to understand. We know from the experiments of Haldane¹²⁴ and Dennig et al.⁶⁶ that a severe experimental acidosis induces at first a large loss of fixed base (mostly sodium), concentration of the plasma proteins, and hæmoglobin.¹¹ The acidosis must be pronounced to bring about these effects,¹⁵⁵ and even under Dennig's severe experimental conditions the loss of base did not continue for more than a few days. There was, in fact, some retention of sodium in the later stages,⁶³ and removal of the acidosis led to an immediate swing back to normal.^{66 206} The body's chief protection against such a loss of fixed base is the ability of the kidney to form and excrete ammonia.

The blood picture in diabetes and diabetic coma has been very fully studied, and is in keeping with a salt deficiency. There is no doubt for instance that in comatose patients^{135 250 262} or depancreatized animals¹⁴⁶ the plasma proteins tend to be raised and the red cells concentrated. These findings may be due solely to the water loss caused by the high blood-sugars and forced diuresis,²⁵¹ but are to be expected also

with a salt deficiency. Reverse changes take place during recovery.^{171 174} Plasma chlorides tend to move inversely with the blood-sugar in experimental and clinical diabetes of all grades of severity,^{103 220 221 234 307} and even in non-diabetic animals.⁴⁸ There may be a great reduction in the plasma chlorides in coma,^{26 27 43 87 169 249} which indicates a deficiency of extracellular electrolytes. The urinary chlorides are commonly very much diminished.^{43 87 188} It has even been suggested that the fall in serum chlorides is the cause of the insulin resistance of coma²⁵⁷ but this is not a very satisfactory hypothesis, and in any case, in spite of their absence from the urine, the plasma chlorides may be normal or even high in coma.^{8 188 251} Diabetic tissues take up the chloride ion with abnormal avidity.² A fall of serum chlorides must not be considered to be proof of a salt deficiency, and the only reliable index of this is a fall in the serum sodium. Such a fall has been demonstrated in coma and pre-coma,^{135 171 188 249} and it is natural to regard this as the result of the acidosis.^{27 239} Atchley et al.,⁹ moreover, have demonstrated by balance experiments that a loss of fixed base took place when insulin was withheld for some days from severe diabetics in whom ketosis developed. On the other hand they also observed a small negative sodium balance and a small fall in the serum sodium in another patient in the absence of ketosis, and according to Sunderman et al.³⁰⁶ there may be a rise in the total base of the serum following a single large dose of insulin to a non-ketosed subject. However that may be, the published figures for serum sodium, coupled with the knowledge that the serum volume is reduced, makes it clear that the patient in coma has lost a variable and often large fraction of his body sodium. According to Blum et al. this loss may be very considerable and amount to 40 or 50 per cent. of the total sodium in the body.^{24 28} A loss of this magnitude must mean a serious fall in the electrolytic osmotic pressure of the intracellular fluids. The total osmotic pressure may, however, be high¹⁴⁶ due to the very high blood-sugars. Assuming the concentration of sugar to be the same throughout the body fluids, the water distribution between the cells and plasma will be unaffected by the sugar, and resemble that of simple salt deficiency when the total osmotic pressure of the plasma is low. Be that as it may, the total osmotic pressure of the body will undoubtedly become subnormal under the action of insulin, and this will be accentuated if water without salt is taken with the insulin and absorbed.¹⁷¹

In diabetes the ability of the kidneys to form ammonia is normal¹⁸⁸ and only an intense acidosis will produce a serious loss of fixed base. In chronic interstitial nephritis the power to form ammonia is impaired,^{205 243 295} and in my opinion this is why a normal production of acids can bring about the loss of fixed base.²¹³ In this disease some of the general signs, which I have tried to show you are generally associated with sodium deficiency, are absent. There is no hæmo-concentration for instance. I think the explanation must lie in the secondary changes which have time to develop in such a chronic disease. You will remember that I explained the differences between the blood pictures of clinical and experimental Addison's disease in a similar way.

As is usual, however, when the serum sodium is reduced there are generally signs of dehydration and a diminished volume of the extracellular fluids.²⁵³ As in diabetic coma the total plasma osmotic pressure may not be reduced in spite of the reduction of plasma electrolytes. This is due to the very great rise of blood-urea which has usually taken place. This

urea (more certainly than glucose) is equally distributed over both cells and plasma and therefore will not affect the distribution of water between the plasma and the cells. The latter consequently are likely to be swollen up with water which they do not want and cannot get rid of, and which prevents them from functioning normally.

These then are the clinical conditions associated with a loss of extracellular electrolytes. I have attempted to give you some idea of the way in which the losses are brought about and the resulting blood changes. I have also tried to show you how these changes in turn affect the body cells. You will remember that the losses may be accompanied or followed by an acidosis, or an alkalosis—or neither, and that they are often associated with a forced loss of water. Owing to these complications and the other pathological processes which are going on at the same time, it is difficult to decide how much of the various clinical syndromes may be attributed to the electrolyte deficiency. It is indeed difficult to form a picture of the real effects of a loss of neutral sodium salts, but I shall return to this later. I propose now to discuss other aspects of these diseases and to review them in the light of the blood and tissue changes which I have already mentioned.

The Arterial Blood Pressure in Salt Deficiency

A very low blood pressure is usual in Addison's disease. It is also the rule in diabetic coma. I am not aware of any published observations on the blood pressure in the earlier stages of simple intestinal obstruction, but the later stages are accompanied by shock, collapse, and a lowered blood pressure. Claims have been made that a high salt intake may produce a high blood pressure,³¹⁶ and a low salt diet is believed by some to benefit hyperpiesis. There is then a suggestion that the lowered blood pressure of the diseases under discussion may be a reflection of the reduction of blood volume, brought about by the loss of salt or other cause of anhydræmia. I do not think this is the case, but I must defer giving you some of my reasons for saying so till my last lecture. Meantime let me remind you that in chronic interstitial nephritis, in which a low serum sodium is quite common, the blood pressure is characteristically high.

The Nitrogen Balance

There is a little clinical and experimental evidence which suggests that sodium deficiency (or dehydration) may produce a breakdown of body tissues and set up a negative nitrogen balance. The evidence is at best rather unsatisfactory, but I wish to put it before you because of its bearing on what I shall have to say subsequently. In the first place Addison's is unquestionably a wasting disease, but in the absence of accurate balance experiments one can make little of this evidence owing to the coincident nausea and anorexia. Diabetic coma is invariably accompanied by an extravagant and unbalanced nitrogen breakdown, but the uncontrolled diabetes provides an adequate explanation for it. Some of the earlier work on water deprivation is most unconvincing,^{280 299} but evidence has accumulated^{197 211} that thirst or severe dehydration from diarrhoea,²¹⁷ with or without salt deficiency,¹⁰ may produce excessive breakdown of body protein. Hartwell and Hoguet¹⁴⁰ and Haden and Orr,^{120 122 240} in their experimental work on dogs, showed that intestinal obstruction caused a much greater breakdown and excretion of nitrogen than starvation alone, and they made some confirmatory observations on patients.¹¹⁴ They showed

that the administration of saline prevented this increased nitrogen excretion, and suggested¹²² finally that it was due to a loss of chlorides, but it must be remembered that Whipple and his collaborators^{57 336 337 338} considered that the breakdown of body protein observed under similar circumstances was the result of a proteose intoxication. The two views have been reconciled to some extent by the suggestion that the "toxin" is endogenous histamine produced by the injured intestinal cells, and that its action is to accentuate the loss of chloride by its stimulation of the gastric glands.⁷ There is, therefore, uncertainty as to the cause of the tissue disintegration, and it must be admitted that experimental interference with the continuity of the alimentary canal does not provide ideal conditions for a study of the nitrogen balance, and in clinical practice it will always be negative because of the diminished intake.

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SOME OBSERVATIONS ON THE EXCRETION OF ASCORBIC ACID

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THE condition of scurvy in an adult is rarely seen in England. The in-patient records of St. Bartholomew's Hospital show that such a diagnosis has only been made three times in the last 22 years. The latest of these cases was diagnosed in July, 1935, when a man, aged 63 years, was brought by the police to the hospital because he had fainted in the street. The detailed investigation of this case is here recorded.

During the last two years the man had been out of work and his health had begun to fail. He was only able to walk two miles without getting tired, whereas previously he could walk eight miles. For the last six months he had tired very easily and his teeth were decaying. Four weeks previous to admission the patient noticed some difficulty in walking; his legs felt weak. For the last fortnight the appetite had been very poor. A red patch appeared on the ankles; then some pain was felt in the right knee, which swelled slightly and became discoloured with a bruise, blue at first and then red and yellow. The swelling and bruising continued to spread above and below the knee, and when he first came to the hospital, three days before admission, the legs showed petechial hæmorrhages about the ankles, and swelling and bruising of the subcutaneous tissue about the knees. It was not possible to admit him on that day, but admission was arranged for three days later. On his way to the hospital he felt very tired and sat down on a doorstep where he was found by the police in a fainting condition and brought up to the hospital.

Past health.—Gonorrhœa at 32. Right hydrocele for the last ten years. His general health had been very good and although he had travelled in many countries he had never had any tropical disease.

Condition on admission.—Well-made elderly man, looking rather ill. The eyes showed no abnormality; tongue clean. The teeth were nearly all present, but several were decayed and loose. The gums were red, soft, and much swollen, especially at the right side of the lower jaw; at this point the gum nearly reached the top of the teeth and bled easily when touched. The glands in the neck were not enlarged. The heart, lungs, and abdomen did not show any abnormal physical signs apart from the hydrocele. Blood pressure 185/70. The lower part of the right thigh was swollen and the skin was stained blue, red, and yellow. The right knee was swollen and appeared to contain a little fluid. The calves, shins, and ankles showed some petechial hæmorrhages which were almost confluent behind the ankles and heels. Œdema was present and extended half way up the calf of both legs. The tourniquet test did not cause any petechial hæmorrhages on the arms. The temperature was 98° F. on admission, and rose to 99° that night, but subsequently remained below 98·4°. The pulse varied from 60-80. Respiration 20. The urine did not contain any albumin, blood, or sugar. (Three days later a few red cells were found in the urine on microscopic examination.) The presence of swollen and bleeding gums together with bruising and petechial hæmorrhage suggested the diagnosis.

DIET PREVIOUS TO ADMISSION

The man was out of work and was living alone on a sum of only 17s. 6d. a week; he had drawn up

The remaining references of Lecture II. will appear with the concluding part of this lecture next week.

a careful budget and allowed 6s. 2d. a week for food.

Expenditure on food.		Other expenses.	
	Per week. s. d.		Per week. s. d.
Meat or fish at 4d. per day	2 4	Gas (average)	9
Egg, meat, or sardines at 2d. per day	1 2	Tobacco and matches ..	6
Bread	1 0	Washing	9
Tea, cocoa, coffee	6	Soap, stamps, &c. .. .	3
Sugar	4½	Clothes (set aside) .. .	6
Condensed milk	2½	Papers and library book	4
Butter	3	Amusements	7
Potatoes, salad, or fruit	4	Beer (Saturday night) ..	4
	6 2	Rent	6 0
			11 0

Details of diet.—Breakfast: 2 eggs or meat pie or sardines, bread and butter, coffee. Dinner: 6 oz. meat, bacon, or fish; chip potatoes, bread and butter. Supper: cocoa, bread and butter. A little salad and some stewed fruit was eaten one or two days a week. Fried onions and potatoes once a week. Green vegetables were never eaten because of the expense of the gas for cooking them. A little tinned pineapple had been eaten about four weeks before admission. It is difficult to say how much salad was eaten, but probably a very small amount as only 4d. a week was spent on potatoes, salad, and fruit. The vitamin content of the diet was thus very small.

Mr. G. T. Hankey examined the gums the day after admission and reported that the "swollen, hemorrhagic appearance of the gums is probably scorbutic."

Blood count.		Differential count.	
Hæmoglobin	54 per cent.	Polynuclear cells ..	4224 per c.mm.
Red cells	2,680,000 per c.mm.	Lymphocytes ..	1792
Colour-index	1.0	Large mononuclears ..	320
Leucocytes	6400	Eosinophils ..	40

Bleeding time, 1½ mins.; platelet count, 190,000; Wassermann reaction negative.

X ray examination of the legs did not show any subperiosteal hemorrhage.

THE DIAGNOSIS

The absence of fever and a raised pulse-rate was against the diagnosis of a septicæmia or a subacute bacterial endocarditis. The white count of 6400 and the absence of any abnormal cells excluded leukæmia and the number of platelets and the normal bleeding time a thrombocytopenia.

In order to determine the excretion of ascorbic acid, we kept the patient, who had eaten some potatoes and green vegetables for dinner, and some orange juice at tea-time on the day of admission, for the next six days on a diet containing practically no ascorbic acid; the amount excreted in the urine was estimated each day except on Saturday and Sunday.

The titration of specimens of urine for their ascorbic acid content was carried out by the Tillmans' reduction indicator 2-6 dichlorophenol indophenol modified as suggested by Harris and Ray.¹ Before titration, acetic acid was added to the dye solution in such amount that the concentration of acetic acid at the end of the titration was in the region of 10 per cent., a preliminary titration giving the clue to the amount of acetic acid required. The solution of dye was standardised against freshly prepared solutions of ascorbic acid, the check being repeated at intervals of three days. The ascorbic acid solutions were checked by titration against 0.01 N iodine. All forms of ascorbic acid administered during the tests were titrated against the dye solutions used for the urinary estimations. As far as possible fresh specimens of urine were titrated but where this was found difficult, as in the examination of the night material, the ascorbic acid that had undergone reversible oxidation was recovered by reduction with H₂S as described by Emmeric and Van Eckelen.² Grace Medes³ has shown that the pH of the urine is of great importance in this process. Experiments

in this laboratory with urines allowed to undergo partial oxidation on standing showed that if the initial pH of the urine was in the region of 6 to 6.5 treatment by H₂S resulted in a 95 per cent. recovery after the specimen had been standing for 18 hours. The results in estimating urines of very low ascorbic acid content by this method are certainly too high owing to some reduction by other constituents of the urine, but as in these investigations the substantial quantitative variations in excretion on scorbutic and ascorbic diets were of moment, the errors which must be considered in estimating very small amounts could be ignored.

The amount of ascorbic acid excreted in the urine was very small and varied from 6-18 mg. on the first six days (Fig. 1). On the seventh day 300 c.c.m.

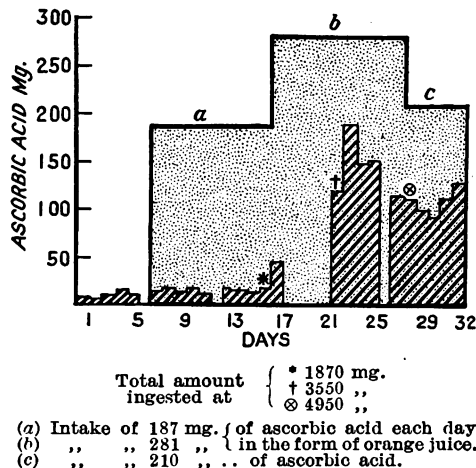


FIG. 1.—Showing the amount of ascorbic acid excreted (diagonal shading) in relation to the amount ingested (stippling) over a period of 32 days in a scorbutic patient. When a total of 4950 mg. had been ingested the excretion amounted to an average of 53 per cent. of the intake.

of orange juice was added to the diet; the amount of ascorbic acid in this amount of juice was estimated by the dye test at 187 mg. The excretion of ascorbic acid in the next ten days was slightly larger and varied from 10 to 19 mg. a day (average 15 mg.). If it is assumed that the dye test is accurate when such small amounts are being excreted, 150 mg. were excreted out of a total of 1870 mg.—that is, a difference of 1720 mg. On the seventeenth day the dose was increased to 281 mg. which was contained in 450 c.c.m. of orange juice. On the first day of the new diet—i.e., the seventeenth day—the excretion rose to 42 mg. The ascorbic acid was not estimated during the next four days as the laboratory was closed for the August Bank Holiday and the ascorbic acid could not be preserved more than 24 hours. From the twenty-first to twenty-sixth day the excretion of ascorbic acid varied between 115 mg. and 190 mg. and the average excretion was 126 mg. a day; as the daily intake was 281 mg., 46.6 per cent. was excreted with urine. During the next five days 210 mg. of pure ascorbic acid was given each day instead of orange juice. The average excretion for the five days was 110 mg. and 51 per cent. was excreted. This shows that the pure ascorbic acid behaved in the same way as that contained in the orange juice.

THE THERAPEUTIC TEST

During the first six days after his admission to hospital the patient definitely improved in health. All the cedema subsided and the bruising of the thighs was slightly less; the fluid in the right knee-

joint disappeared. The teeth had been scaled by Mr. Hankey and the gums, touched with silver nitrate 10 per cent., showed a definite improvement, but the gums were still much swollen and bled easily. Though a little vitamin C had been given at dinner and tea on the day of admission, the improvement was probably due mainly to the rest in bed. Very rapid improvement followed the administration of the orange juice; after three days it was noted that the bruising was passing off and that the gums were retracting very quickly; after eight days there was still a little bruising round the left heel. The teeth presented a remarkable appearance; the retraction of the gums had exposed a broad band of white tooth which was in striking contrast to the stained crown. The improvement in the blood picture was also interesting:—

Date. (1935)	Hb. (per cent.)	Red cells.	C.I.
July 22nd	63	2,800,000	1.1
„ 26th	67	3,300,000	1.0
Aug. 9th	66	3,700,000	0.9
„ 21st	79	4,500,000	0.8

During this period no iron or liver was administered. The colour-index of 1.1 had raised some doubt as to the nature of the anæmia, especially as it is stated by Vaughan⁴ that the anæmia of scurvy is a hypochromic one, but Parsons and Smallwood⁵ have pointed out that even in children the anæmia may be ortho- or hypochromic in character. The rapid recovery of the patient confirmed the clinical diagnosis of scurvy.

The excretion of ascorbic acid was estimated in two other cases to see how soon the excretion of

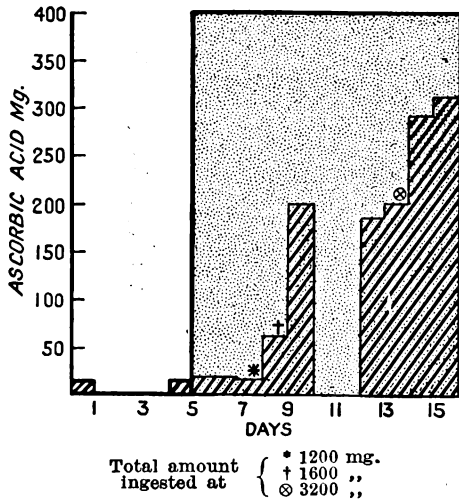


FIG. 2.—Showing the amount of ascorbic acid excreted in relation to the amount ingested over a period of 17 days by a man on a diet deficient in ascorbic acid but with no symptoms of scurvy. No rise in the excretion occurred until 1200 mg. had been taken. The excretion rose to an average of 48 per cent. of the intake after 1600 mg. had been ingested, and to 75 per cent. after 3200 mg. had been ingested.

ascorbic acid increased and what percentage of the dose was excreted.

CASE 2.—A man was brought to hospital because he had fainted in the street. On examination he seemed ill with a temperature of 100° F. and was admitted to hospital. Although there were no symptoms of scurvy, the diet which he had been eating seemed as deficient in ascorbic acid as that of the man with scurvy (Fig. 2). The opportunity was taken to estimate the amount of ascorbic acid excreted first on an ascorbic diet, and then after a daily dose of 400 mg. of pure ascorbic acid. The amount

of ascorbic acid excreted was small (10–16 mg.) and no rise in the excretion occurred until 1200 mg. had been taken. The percentage output excreted after 1600 mg. had been eaten was 48 per cent., and after 3200 mg. 75 per cent.

CASE 3.—A healthy man who eats plenty of fruit was examined for comparison. A mixed diet was taken which contained potatoes and vegetables together with 125 c.cm. of tinned grape fruit and 70 c.cm. of tomato juice. The ascorbic acid content of this diet was 63 mg., not including that in the potatoes and vegetables. The excretion of ascorbic acid was 43 mg. and 54 mg. on the first and second day of the experiment. The diet was then changed to one containing no potatoes, vegetables, or fruit, but 400 mg. of ascorbic acid were taken each day for ten days (Fig. 3). The excretion rose to 262 mg. on the first day and to 418 mg. and 403 mg. on the second and third days. The urine was not collected on the fourth and fifth days, but on the sixth day 416 mg. were excreted. During the next four days the same diet was taken without the addition of the ascorbic acid. The excretion decreased to 92 mg. on the first day and to 23 mg. on the fourth day. The total ascorbic acid excreted on the second, third, and sixth days was 1236 mg. and the known intake was 1200 mg. This apparent discrepancy is explained by the high intake of the previous diet. It is impossible to say what percentage of the intake was excreted, but it must have been over 90 per cent.

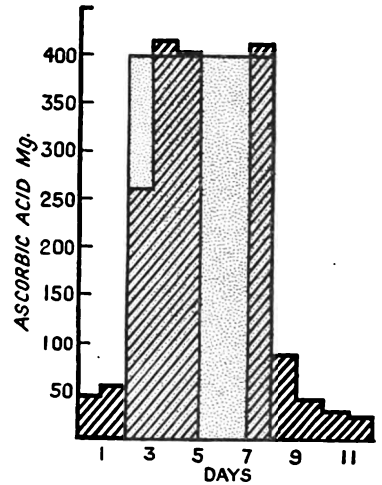


FIG. 3.—Showing the rapid rise in the excretion of ascorbic acid in a healthy man whose previous diet had contained much fruit to whom 400 mg. of ascorbic acid was given over a period of six days. In two days the excretion had amounted to more than the known intake, showing the high previous content of the diet.

DISCUSSION

Abbasy, Harris, Ray, and Marrack⁶ have recently published some very interesting experiments on the excretion of ascorbic acid. They suggest that the estimation of ascorbic acid excreted after a single test dose is of great value in demonstrating the presence of vitamin-C subnutrition. When a healthy adult, whose habitual level of excretion was 33 mg. of ascorbic acid, was given 600 mg. he excreted 161 mg., or 27 per cent., of the dose; whereas when the level was only 14 mg., 35 mg., or 6 per cent. of the 600 mg. administered, were excreted, and when the level was 8 mg. the excretion rose only to 17 mg., that is, 3 per cent. of the amount taken in. Wood⁷ has performed this test on a woman with mild scurvy. No ascorbic acid had been detected in the urine on the day before the test and only 1.7 mg., or 0.3 per cent. of the 600 mg. ingested, was excreted in the urine. These observations after a single test dose undoubtedly show that a deficiency of ascorbic acid exists, but they do not, in our opinion, give such full information as the observation of the amount of ascorbic acid which must be given before the percentage output rises above 75 per cent. In our case of scurvy (Case 1) the significant rise in the excretion occurred when 1700 mg. had been given in comparison with 600 mg. in Johnson and Zilva's⁸ man, and with 1200 mg. in Case 2, and 1400 mg.

in Harris and Ray's case.⁹ This is a very small difference, and it would be difficult to know where to draw a line between scurvy and a potential case of scurvy, and a case of vitamin-C subnutrition. The percentage output in Johnson and Zilva's case rose to 56 per cent. after 1360 mg. and to 87 per cent. after 1480 mg. had been taken; and in Harris and Ray's case it rose to 77 per cent. after only 1480 mg. had been taken, and in our Case 2, although it reached 48 per cent. after 1600 mg. had been ingested, it did not reach 75 per cent. until 3200 mg. had been eaten. In Case 1 of our series the percentage output did not exceed 53 per cent. even after 4950 mg. had been eaten.

The observation on our single case of scurvy suggests that the percentage output is much more valuable evidence that a patient has scurvy than the amount of ascorbic acid taken before the excretion increased, or the amount excreted after a test dose.

We have to thank Miss J. Marks, M.P.S., for much assistance in the estimation of the ascorbic acid, and Miss Cambell, the sister of the ward, for her care in supervising the diet and collecting the urine.

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THE TREATMENT OF
CARCINOMA OF THE CERVIX UTERI
BY THE STOCKHOLM TECHNIQUE AT THE
LONDON HOSPITAL

1929 AND 1930

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DURING the two years 1929 and 1930, 71 cases of carcinoma of the cervix uteri were referred to the obstetric and gynæcological department of the London Hospital for treatment. No case, however advanced, was refused treatment.

Four early cases were treated by Wertheim's hysterectomy (2 of these were complicated by pregnancy and the other 2 were considered exceptionally good subjects for a major surgical operation). The subsequent history of these 4 cases is as follows:—

- One died of recurrence 1 year and 5 months after operation.
- One was dying of recurrence when last seen 2 years and 8 months after operation.
- One was alive and well when last seen 1 year and 9 months after operation.
- One is alive and well more than 5 years after operation.

The remaining 67 cases were treated with radium by a technique as similar as possible to that published by Forssell and Heyman from Radiumhemmet, Stockholm. In brief, the treatment has consisted of three applications of radium, with intervals of 7 and 21 days, each application consisting of about 120 mg. of radium element, partly intra-uterine and partly

vaginal. The duration of each application has been 22–24 hours, and a heavy screenage—equivalent to 2 mm. of lead in 1929 and to 3 mm. of lead in 1930—has been employed.

For various reasons 14 of the cases did not receive the complete treatment (9 cases received two applications only and 5 cases one application only). Three of these patients died in hospital before treatment could be completed; 7 other cases were so advanced (Stage III. or IV.) and their reaction to radium was so unsatisfactory that it was deemed inadvisable to proceed with treatment; the remaining 4 were Stage II. cases and failed to come in for further treatment although advised to do so. All these 14 patients are now dead.

Until the autumn of 1930 no really effective deep X ray therapy was available for the treatment of these cases, and in this series it has been used only for the treatment of definite clinical recurrence in the pelvis arising some time after the original radium application.

DIAGNOSIS

Although some authorities are of the opinion that there is some danger of disseminating malignant cells by removing a fragment of a malignant growth for histological examination, we have felt that the advantage of confirming the macroscopic diagnosis by this means outweighs this debatable objection. In this series the diagnosis has been confirmed histologically in all 4 cases treated by Wertheim's hysterectomy, and in addition the uteri removed at operation have been preserved. In the 67 cases treated with radium the diagnosis has been confirmed histologically in 59 cases; in the remaining 8 cases in which the nature of the growth was unproved histologically, 6 have died of recurrence, 1 is untraced, and 1 only is alive and well more than five years after treatment.

RESULTS

The results of treatment with radium are set out in Table I.

TABLE I

	Cases.
Died in hospital during treatment (primary mortality 4.5 per cent.)	3
Died within first year after treatment (4 had secondary medium X ray therapy)	19
Died within second year after treatment (3 had secondary deep X ray therapy)	10
Died within third year after treatment (1 had secondary deep X ray therapy)	11
Died within fourth year after treatment (1 had secondary deep X ray therapy)	2
Died within fifth year after treatment (1 had secondary deep X ray therapy)	3
	48
Local recurrence in cervix 4½ years after treatment. Still alive after recent fourth application of radium.	1
Recurrence in bladder 19 months after treatment. Now alive and well 4½ years after fourth application of radium to recurrence	1
Recurrence in bladder 14 months after treatment. Now alive and well 5½ years after fourth application of radium to recurrence	1
Alive and well with no clinical evidence of any recurrence more than 5 years after treatment (1 had secondary deep X ray therapy)	15
Untraced	1
	67

It will be seen that there are 16 five-year cures out of 67 cases treated with radium—that is, 24 per cent.

The 59 cases treated with radium and proved histologically to be carcinoma consisted of 54 in which the carcinoma was epidermoid in structure and 5 in which it was of glandular columnar-celled type. In the former group 14 are alive and well after more than 5 years, and in the latter 1 patient is alive and well after a similar period.

In Table II. these 67 cases treated with radium are grouped into the four stages according to the anatomical extent of the growth recommended by the Radiological Sub-Commission of the League of Nations, Geneva, 1929.¹ The following results are shown:—

TABLE II

Stage	I.	..	15 cases with 6 five-year cures	..	Per cent.
"	II.	..	20 " " 6 " " "	..	40
"	III.	..	25 " " 4 " " "	..	30
"	IV.	..	7 " " 0 " " "	..	16.6
					—

Stages I. and II. constitute cases probably operable, and if the results are combined then there are 35 cases with 12 five-year cures—34.3 per cent. When Stages III. and IV., which constitute the cases probably inoperable, are combined then there are 32 cases with 4 five-year cures—12.5 per cent.

Table III. represents an analysis of the effect of age-incidence of the disease on the results obtained with radium treatment in this series of cases.

TABLE III

Age.	Cases.	Five-year cures.
20-29	.. .. 2	.. .. 0
30-39	.. .. 7	.. .. 3
40-49	.. .. 25	.. .. 3
50-59	.. .. 19	.. .. 6
60-69	.. .. 9	.. .. 3
70-79	.. .. 5	.. .. 1

The high primary mortality of 4.5 per cent. is due to 3 deaths occurring during treatment in hospital.

CASE 21.—This patient had a Stage II. carcinoma of the cervix, which was treated with one Stockholm application of radium. Under the same anaesthetic a primary carcinoma of the left breast was treated by the insertion of surgical radium needles. The patient died one hour after her return to the ward, and a post-mortem revealed that the cause of death was hæmopericardium secondary to perforation of the heart by a radium needle inserted under the left breast penetrating an intercostal space. If this case is excluded—and the death cannot reasonably be attributed to the Stockholm treatment of carcinoma of the cervix—then the primary mortality is 2 cases out of 67, that is, 3 per cent.

CASE 31.—A patient, aged 70, with Stage II. growth, died eight days after the second application of radium with spreading peritonitis. Post-mortem examination revealed gangrene and infection of the left half of the fundus of the uterus. The growth was scirrhous, constricting the cervical canal, and associated with pyometra. Had the pyometra been drained for a week or ten days prior to radium treatment, then in all probability this death would not have occurred.

CASE 53.—A patient, aged 22, with a Stage IV. growth, had a marked febrile reaction and recurrent secondary hæmorrhages following the first application of radium. She remained in hospital for twelve weeks and died ten days after the second application of radium. This death can be more fairly attributed to the final stages of the disease than to its treatment with radium.

TABLE IV

Year.	Number of cases.	Percentage of five-year cures.
1920	.. .. 96	.. .. 27.1
1921	.. .. 115	.. .. 23.5
1922	.. .. 130	.. .. 20.0
1923	.. .. 105	.. .. 23.8
1924	.. .. 149	.. .. 23.5
1925	.. .. 134	.. .. 14.2
1926	.. .. 143	.. .. 25.9
1927	.. .. 143	.. .. 25.9
1928	.. .. 128	.. .. 23.4
1929	.. .. 152	.. .. 30.3

An abstract of the results of treatment of carcinoma of the cervix uteri with radium at Radium-

hemmet, Stockholm, for the years 1920 to 1929,² is given in Table IV.

If these ten years 1920-29 are combined, then 1295 cases of carcinoma of the cervix were treated at Radiumhemmet with 308 five-year cures. This gives an average five-year cure per year of 23.8 per cent.

The treatment of the cases described above has been entirely carried out in the obstetric and gynaecological department at the London Hospital by Mr. Eardley Holland, Mr. Victor Lack, and myself. I am immensely indebted to my senior colleagues for allowing me to organise the treatment, and for allowing me to follow up and publish their cases. It is only their consistent adherence to our agreed technique that has made it possible for us to establish the value of this treatment in a consecutive series of cases. I am also indebted to the Yarrow research fund of the London Hospital for financial help in the initial years of organisation.

The secondary, medium, and deep X ray therapy, when employed, was entirely prescribed and supervised by Dr. G. E. Vilvandré and Dr. M. H. Jupe, the honorary radiologists to the hospital.

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APICAL THORACOPLASTY

WITH A DESCRIPTION OF RECENT MODIFICATIONS
IN TECHNIQUE

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THE increasing use and popularity of upper partial thoracoplasty in the treatment of tuberculous cavities in the lung has led to the development of this operation as a specialised procedure aiming at permanent collapse of these excavated areas, yet still leaving the base and greater part of the lung as a functioning organ. In a previous paper we have outlined the principles which govern the selection for surgical treatment.

In the case of an apical thoracoplasty the operation has usually been an exaggerated form of the upper stage of the standard Sauerbruch paravertebral operation involving resection of considerable lengths of the upper four or five ribs under which the diseased area lies. Pulmonary collapse is obtained by a threefold movement of the divided ribs. The posterior cut ends of these anterior portions fall inwards and downwards so that the end of the first rib may lie in close proximity to the second and third transverse process. A certain amount of lateral collapse is also obtained by the downward swing of the main curve of the ribs—the so-called "bucket-handle" action—but in the upper chest this effect is not nearly so noticeable as in the lower part. Whereas the posterior part of the lung apex is set free, the remainder is held attached to the deep aspect of the first rib and, as may be judged from X ray films, undergoes only a small descent. The main part of the collapse is effected in the transverse rather than in the vertical axis.

This form of thoracoplasty not infrequently fails when the cavity is centrally placed or is lying close to the mediastinum. The cavity admittedly becomes reduced considerably in size, but may persist in part as a pear-shaped slit with the long axis vertically placed. The lesion then still remains as an open source of infection and the only remedy for this state of affairs is the performance of an anterior and/or lateral supplementary rib resection. (Figs. 1 and 2.) The amount of scarring produced by the original operation precludes the successful practice of any form of extrapleural pneumolysis as a subsidiary procedure.

It has been common practice in certain hands to facilitate the amount of collapse obtained by an apical thoracoplasty by means of extrapleural stripping. Semb and Holst in a large number of cases have carried this dissection posteriorly into the paravertebral gutter removing the heads of ribs and upwards over the lung dome allowing fascia and muscular bundles to add their weight to the collapsing lung. Radiologically this collapse obtained by this "extrafascial apicolysis" is definitely superior to that produced by the standard operation, but the vertical fall of the apex does not always ensure collapse of cavities close to the mediastinum.

Our experiences with extrapleural pneumolysis and extensive stripping of the parietal pleura from the ribs carried out from in front preparatory to filling the cavity with paraffin wax have led us to

believe that the danger of stripping the pleura from the mediastinum is negligible—a fear that has presumably hindered the common practice of this form of mobilisation over a large area. It was consequently decided to perform the stripping over the whole

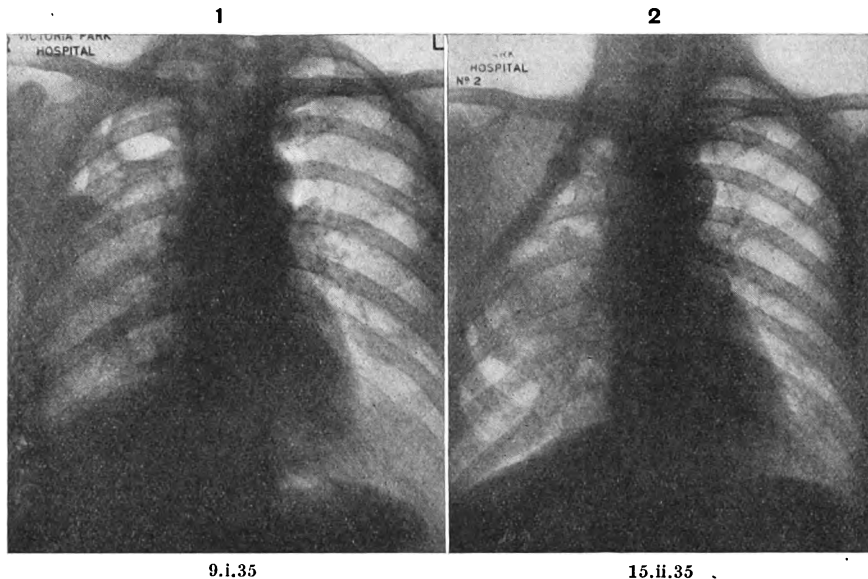


FIG. 1.—Big right apical cavity. Small pneumothorax space towards apex. Right diaphragm raised.

FIG. 2.—After posterior thoracoplasty of upper five or six ribs followed by anterior thoracoplasty Ribs 2 to 4. The cavity though greatly diminished can still be seen below the clavicle at the level of the fourth to fifth vertebrae. This illustrates the persistence of a cavern in spite of extensive rib-resection.

diseased area of the apex in addition to performing the ordinary form of extensive removal of the upper ribs. Gravesen has given the name "cupolaplasty" to this form of operation. A necessary factor in performing this type of operation, as with any form of extrapleural pneumolysis, is fusion of the pleural membranes over the area to be collapsed. This is more commonly found than might be expected, for most of the cases are of long standing and pneumothorax treatment has previously been tried and failed,

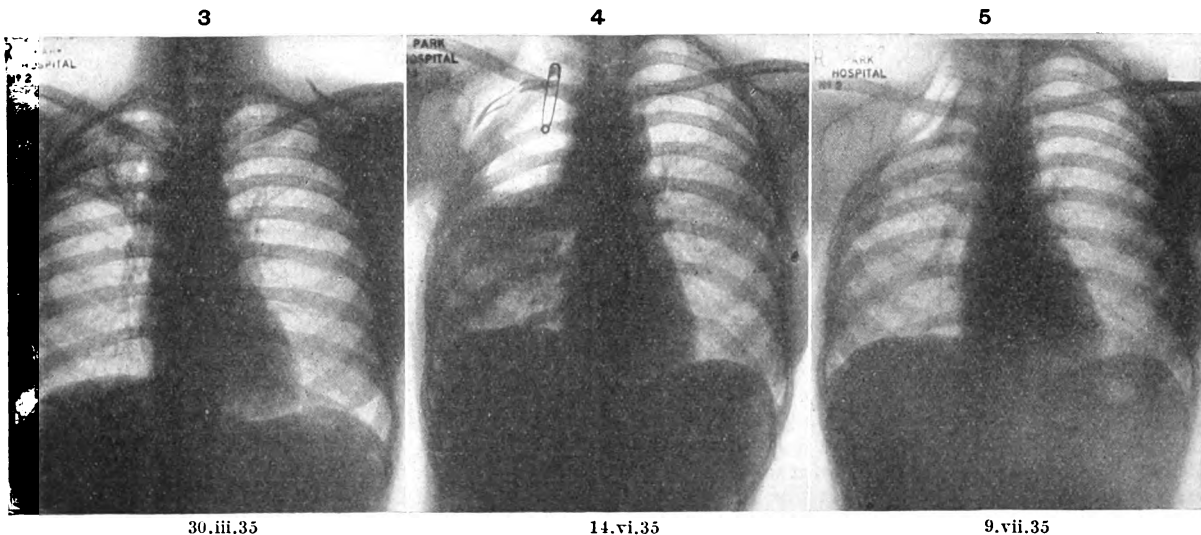


FIG. 3.—Right localised upper zone disease showing fibrosis and cavity formation.

FIG. 4.—After complete apicolysis and resection of Ribs 1 to 4 fluid level is seen and is extrapleural with dense zone of compressed lung tissue between it and the diaphragm.

FIG. 5.—Three weeks later fluid was absorbed and lung has re-expanded, but not above the level of the fourth to fifth transverse processes.

or tried and abandoned. The pneumothorax has usually been abandoned on account of the presence of adhesions over the diseased apical area. Even in cases in which we might have had some doubt as to whether the pleural cavity was completely adherent over the operation field there has been no untoward

removal of a further length of the anterior part of the third rib is carried out, it being recalled that a section of this rib had been removed preparatory to stripping. Then according to the amount of collapse required part of the fourth and/or fifth ribs are resected. We have made it customary to grade the collapse and prevent a sharp shelf being left by removing a short piece of bone in the rib or two below the major part of the resection.

The operation is completed by suture of the muscles and skin after hæmostasis has been assured. Originally we omitted drainage of the wound in the hope that the blood-stained serum that was bound to collect would act as a pad in the dead space and would help to maintain the collapse, until such time as the soft tissues had time to fall in and obliterate this space. The risk of infection, however, is considerable and in consequence we prefer to drain the wound for several days.

There is certainly some tendency for the stripped apex to re-expand unless the rib-resection has been extensive, and to overcome this we have, in a few cases, divided the intercostal periosteal-muscular bundles either anteriorly or posteriorly and sutured them to each other and to the inner aspect of the thoracic cage at a lower level so as to form a grid or coarse meshwork close over the depressed apex. As periosteal regeneration occurs, this forms a rigid barrier beyond which the lung cannot re-expand.

RESULTS

The amount of shock produced in an operation of this character is very little greater than that produced by a rib-resection of the same magnitude; in no case have we found it necessary to perform an operation involving five or six ribs in two stages. As against this it must be admitted that the convalescence is rather more disturbed over the first few days—the temperature and pulse are raised and if a big cavity is present there is usually abundant sputum about the third to eighth day, but pain is not conspicuous, nor is the deformity any more noticeable than with a simple thoracoplasty. The risk of infection of the dead space in this type of patient has been noted, but such infection occurred only in cases that were not drained, and did not lead to serious ill-effect.

X ray films taken shortly after the operation show a collection of fluid lying over the lung apex which is often depressed almost to the level of the hilum. This fluid certainly adds to the collapse actually produced by the stripping, but as time goes on the fluid is absorbed and the upper limit of the lung edge rises to a small extent before becoming stationary. In dealing with firm-walled apical cavities there is no doubt that the operation produces a radiological collapse far superior to that obtained by any other procedure that we have employed with the possible exception of extrapleural pneumolysis with wax implantation. But this latter is accompanied by the

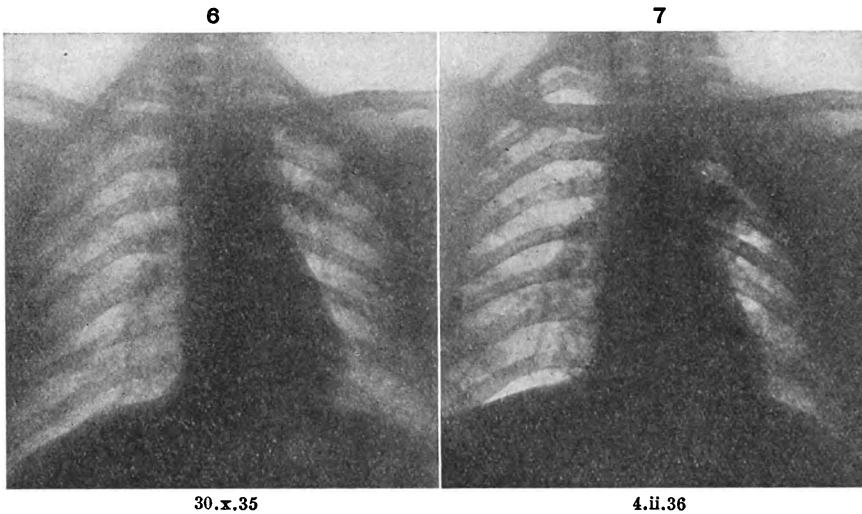


FIG. 6.—Big infraclavicular cavity on the left.

FIG. 7.—Film taken ten days after operation showing depression of the apex of the lung below the fourth vertebra and almost complete obliteration of the cavity. Complete closure obtained later.

circumstance such as might be occasioned by tearing of the parietal pleura.

TECHNIQUE

The operation commences as an ordinary upper thoracoplasty, and the muscles attached to the vertebral border of the scapula are divided through a J-shaped incision made midway between the scapula and spinal column. The scapula is lifted off the chest wall and the upper ribs are exposed. The periosteum of the third and possibly the second ribs is removed and an extensive length of both bones removed. Before proceeding to do anything to the first rib this stripping is done, and it immediately renders the subsequent removal of a long length of the first rib considerably easier. To effect the stripping the finger is carefully worked into the rib-bed until the space normally occupied by the endothoracic fascia is found. The plane of separation is easily recognised and dissection is carried upwards and outwards with the fingers within the rib framework until the whole of the apex is freed. Steady and careful pressure enables this stripping to be done without difficulty, though occasional resistance is encountered in the form of firm bands of adhesions. These, however, can be overcome safely so long as the finger pressure is kept well to the deep surface of the ribs. When the apex is free it falls downwards to a marked degree and if further depression is required it can be carried out beyond the lower limits of the third rib. There is slight oozing from the raw bed, but this stops readily and the apex can be held down with a swab while the remaining part of the rib-resection is performed. These ribs are now freed of their periosteum preparatory to their resection, and one of the chief advantages of the preliminary stripping lies in the fact that the deep surfaces and even the anterior parts of the upper two ribs can be easily reached. It is possible to remove the whole of the upper two ribs without encountering any of the difficulties that occur in other forms of this operation. At times

not infrequent complication of extrusion of the wax at a very variable period after the operation.

The following cases illustrate the results obtained with the combined pneumolysis and thoracoplasty:—

1. Woman aged 23. Chronic left apical disease with cavity known to be present three years. A.P. (artificial pneumothorax) failure. Complete apical stripping with resection of upper four ribs. Total length of rib removed, 22 in. Cavity obliterated rapidly. Patient started to put on weight a fortnight after operation. No. T.B. (tubercle bacilli) in sputum.

2. Man aged 26. Extensive right upper zone cavitation. A.P. failure. Complete apical stripping with resection of upper five ribs. Total length of rib removed, 21 in. Good apical collapse was obtained.

3. Woman aged 20. Right apical fibrocavernous disease. A.P. failure. T.B.+. Complete mobilisation of apex with resection of ribs, 1, 2, 3, and part of 4. Total length, 16 in. Wound not drained. Thin seropurulent fluid collected in the dead space and discharged through the wound on the twelfth day. The sinus ultimately closed. Patient has put on over 2 st. in weight. T.B. absent. (Figs. 3-5.)

4. Man aged 31. Right apical cavities. T.B.++. A.P. failure. Complete apical stripping and resection of ribs 1, 2, 3, 4, and part of 5. Total length, 18½ in. A "grid" of muscle and periosteum. Wound not drained. Collection of fluid in dead space compressed lung and about three weeks after operation broke through into a bronchus. Blood-stained fluid was coughed up for several days and the extrapleural cavity emptied. Ultimate result good. T.B. absent.

5. Man aged 34. Large single cavity of left apex. T.B.+. Complete apical stripping and resection of ribs 1, 2, 3, 4, and 5. Total length 26 in. A "grid" was made over the apex. Successful collapse. Highest point of lung lies between the levels of the fourth to fifth transverse processes. (Figs. 6 and 7.)

As regards the end-results it is too soon to judge. The operation, however, has as its primary aim closure of cavities and in this it would appear to be more satisfactory in selected cases of localised apical disease than any method that we have previously employed.

STENOSING TENDOVAGINITIS AT THE RADIAL STYLOID PROCESS

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STENOSING tendovaginitis was first described by de Quervain¹ in 1895, and subsequently by Hoffmann² in 1898. Since that time nearly 200 cases have been reported, mostly by continental writers. We are aware of only one case recorded in this country³; yet the condition is by no means uncommon, and it is perhaps almost the only cause, in our experience, of pain in the region of the styloid process of the radius with disability in movements of the thumb. Stenosing tendovaginitis occurs far more often in women, but among our 28 cases there were 3 men. In this series the ages range from 15 to 49, the commonest age being about 35. There was usually a history of some two to four months' pain, coming on insidiously without definite history of trauma. The majority of the women were engaged in household work, and the commonest complaints were of

pain on wringing and a tendency to drop things, particularly in movements involving radial abduction, as in lifting a kettle. The condition sometimes occurs in an acute form in turnip toppers, but this occupation being seasonal it seldom becomes chronic in these patients.

The symptoms and signs are typical. Strong active abduction of the thumb is painful. There is a visible swelling over the styloid process of the radius (Fig. 1), which in some cases may partially obliterate the anatomical snuffbox. It extends for a short distance up the radius, and there is tenderness over the swelling.

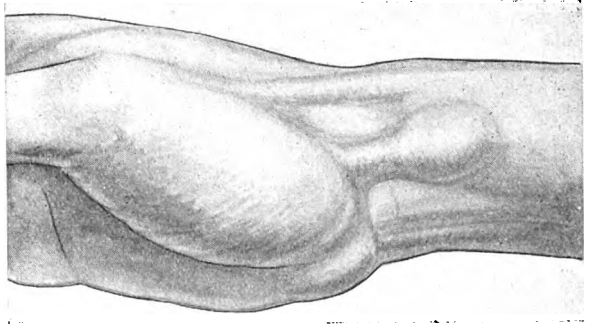


FIG. 1.—Drawing showing a particularly well-marked swelling; more commonly the swelling is less definite.

The diagnosis is certain if, on grasping the patient's thumb and quickly adducting it, there is sharp pain over the styloid process. The condition is due to obstruction of the free movements of the tendons of the extensor ossis metacarpi pollicis and extensor brevis pollicis as they pass beneath the dorsal carpal ligament.

Morbid Anatomy.—The fibrous tendon sheath of the two tendons is thickened, and in severe cases may be as much as four times the normal thickness, which is 1/32 in.⁴ The lumen of the sheath is narrowed. In mild cases the slight thickening of the tendon sheath may be the only finding, but in the more severe cases the narrowing of the lumen produces a constriction and even flattening of the tendons, which may be bulbous beyond the constricted area. The thickened sheath may have lost its lustre and be brownish in colour; new blood-vessels may be observed in it. It may have an almost cartilaginous consistency, and frequently appears hyaline or oedematous. Occasionally there is a synovial effusion, but the synovial membrane is not thickened and may be absent, with consequent adhesions to the tendon. These adhesions, composed of new fibrous tissue, appear almost like a pannus, and are not readily stripped from the tendon.

A section of the thickened sheath shows large quantities of new fibrous tissue, which is markedly cellular. A few new blood-vessels may be observed surrounded by lymphocytes and an occasional plasma cell. In the more superficial layers, which appear to be those of the original sheath, elastic fibrils are present. Some of the fibrous tissue shows mucoid degeneration.

Differential Diagnosis.—The only other conditions likely to be confused with this one are fractures of the scaphoid, in which there is tenderness in the anatomical snuffbox with weakness of the wrist. But in these cases there is no tumour, and the diagnosis is confirmed by radiography. The more difficult differential diagnosis is from sprain of the external

lateral ligament of the wrist, which is a much less common condition. Careful examination will show that the tenderness is limited to an area distal to the radial styloid process, and whereas adduction of the whole hand is painful, that of the thumb alone is not so.

Treatment.—Cases have been reported where fixation of the thumb in abduction has relieved the

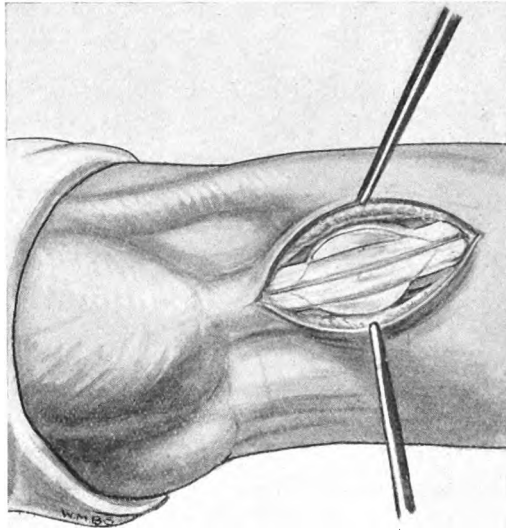


FIG. 2.—The short extensor tendons are exposed and the superficial part of the thickened sheath cut away showing this structure in section.

symptoms (Hoffmann), but in three of our earlier cases this method was unsuccessful. de Quervain first treated these cases by simple incision of the constricting sheath. This manœuvre produces immediate relief, and in no cases has it failed. It is therefore obviously the method of choice. Local anaesthesia is satisfactory. An incision is made through the skin over the swelling and the fibrous sheath partially excised (Fig. 2). The free motion of the tendons is immediately obvious, and only the skin need be sutured.

We have not considered it necessary to report our 28 cases in detail, as they are essentially similar and the results of operation are uniformly satisfactory. They may be summarised as follows:—

Analysis of 28 Personal Cases. (16 V. H. E. 12 B. H. B.)

3 males, 25 females, ages 15–49 (Mode. 35).

22 treated by operation. All cured immediately.

3 treated by plaster, with no permanent relief.

3 refused treatment. One of these went to another hospital, where manipulation was performed with no benefit.

With others, we have been struck by the similarity of this condition to the thickening of the tendon sheath which causes snap fingers and thumb. Similar thickenings have been found in other tendons about the wrist—namely, the extensor carpi radialis longior, the extensor carpi ulnaris, and the flexor carpi ulnaris.

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A CASE OF PEMPHIGUS ACUTUS

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THE following brief record of a case of pemphigus acutus (butcher's pemphigus) may be of interest on account of the rarity of the condition.

History.—The patient, a man of 21, commenced work as a slaughterman five weeks before admission to the Little Bromwich Hospital on Nov. 3rd. From Oct. 17th to 26th he had been treated for a septic finger—the result of a prick at work. On the day before admission he noticed some small red papules on his chin, which spread rapidly during the ensuing 24 hours, involving his cheeks and both upper limbs, many becoming vesiculated. His general health was good, but he reported to his doctor and was notified as a case of suspected glanders. The patient, who had lived in the country all his life, had never been vaccinated. Subsequent inquiries at the slaughter-house revealed that no animal had been slaughtered recently which was suffering from any unusual disease.

Examination on admission showed a well-developed youth whose face and upper limbs were the site of vesicular and pustular lesions, varying in shape and size, the largest being about an inch and a half in the greatest diameter. The majority were round, while some were oval and others irregular. All were surrounded by an area of inflammation. A few were umbilicated and others were discharging a seropurulent fluid. The lesions on the face were mainly confined to the chin and cheeks, the forehead being almost unaffected. The trunk was clear, but the extensor aspects of the thighs showed a few papules with some small vesicles. There was a small healing scar with a central scab over the first interphalangeal joint of the ring finger of the left hand. The tongue was heavily furred, while the throat was very congested and both tonsils were covered with a thin film of exudate. The breath was fetid. Temperature 101° F.; pulse-rate 124; respirations 24. No evidence of a primary chancre could be found and the Wassermann reaction was negative. Fluid aspirated from the lesions gave no *Bacillus mallei* or *Streptothrix actinomyces*, but a good growth of non-haemolytic streptococci was obtained.

Progress.—Lesions continued to appear for five days after admission, the scalp and back becoming involved, while the anterior aspect of the trunk remained clear. The throat was exceedingly painful and as a result swallowing was almost impossible, but no vesicles appeared on the throat or palate. The temperature remained elevated until the rash was fully developed, reaching a maximum of 103° F. on the evening after admission. The condition gradually subsided and except for a rise in temperature ten days after vaccination—which was performed on Nov. 4th and produced local pain and inflammation—convalescence was uneventful. The lesions slowly crusted and when these separated no scar was left. The patient was dressed three weeks after admission to hospital and discharged a week later. He reported a month after discharge when all that could be seen was slight bluish staining of the skin where the lesions had been. His general health was excellent.

Treatment.—The larger blisters were removed with scissors, leaving raw deeply congested areas, many showing a clear central vesicle. New vesicles were punctured as they appeared. Further treatment was directed to relieve the intense discomfort caused by involvement of so large an area of the body. A bland ointment consisting of three parts of lanoline and one part of olive oil with ½ per cent. carbolic acid was found beneficial when applied spread on thin muslin. Antistreptococcal serum (20 c.cm.) was given intramuscularly on the third day. When the temperature had settled he was given permanganate baths.

All the nursing staff while attending to him wore gowns, rubber gloves, masks, and goggles, and their arduous task was made very unpleasant by the putrefactive

odour which pervaded the room. His recovery is due to their untiring energy on his behalf.

The case is of interest for several reasons, namely: (1) The similarity of distribution to that of the lesions of small-pox and the rapidity with which they went through the same stages as the small-pox lesion. (2) The absence of any prodromal symptoms. (3) The slightness of the general disturbance considering what large areas of the body were involved. (4) The isolation

of non-hæmolytic streptococci from the lesions, which are usually attributed to the diplococcus of Pernet and Bulloch. (5) The rapid recovery from a condition which in its severe forms is usually fatal.

I am indebted to Dr. J. McGarrity, medical superintendent of the hospital, for permission to publish this case; also to Dr. H. G. M. Henry, of the City Laboratories, for the bacteriological reports.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF MEDICINE

At a meeting of this section held on March 24th the chair was taken by Sir CHARLTON BRISCOE, the president, and Sir WALTER LANGDON-BROWN opened a discussion on the

Medical Aspects of the Menopause

No one, he said, could doubt the importance or the complexity of the subject. The special endocrine difficulties of the menopause could be referred to two causes: (1) the fact that woman, unlike other mammals, had no phase of anestrus; and (2) the bisexual activity of the ovary. Woman started at the menopause a running-down of a clock which had never, since puberty, stopped going; the uterine endometrium knew no rest. The interdependence of pituitary and ovary was now recognised; the anterior lobe liberated œstrin. The study of basophilism had led to interesting physiological deductions. The basophils were inhibitors and the eosinophils were stimulators of the ductless glands. The medulla of the ovary had been described as male and the cortex as female. This bisexuality must greatly increase the upset of the organism when the female part ceased to function. The endocrine state before the menopause had a considerable influence on the abnormal conditions produced by this change. The stout, lethargic arthritic woman apt to have headaches would benefit by thyroid at the menopause; the thin excitable type would not. The obesity of the climacteric seemed to be of the pituitary type, but some women at this time took on an acromegalic appearance. It appeared that when the ovary began to fail the pituitary made a temporary effort to compensate by producing increased sex hormone, and this completely upset the balance. For this reason symptoms could often be relieved—though only temporarily—by giving œstrin. The adrenals also showed increased activity, and the thyroid was speeded up in the direction in which it was already tending.

The vascular changes did not include any intrinsic cardiac changes but there was temporary or permanent hypertension and vasomotor instability. The former might depend on basophilic pituitary activity; these cells often showed hyaline change. The instability seemed to be a direct result of lack of œstrin and the adrenals played a considerable part in its production. Blood pressure rose during shivering and fell steeply during the subsequent flushing. Œstrin preparations alleviated these symptoms, but in some cases they appeared years after oöphorectomy; possibly an undefined cellular change accounted for them. The diencephalon was now regarded as the head ganglion of the sympathetic nervous system and the centre for many emotional phenomena. It also influenced gastric motility. The pituitary was the intermediary between the diencephalon and the gonads.

Purely psychical factors must also be considered and the attitude with which a woman approached the change was of great importance. Women must not feel that their usefulness was ended but must make investments of interests to continue after the menopause. The hypothyroid type tended to suffer from the fibrocytic form of arthritis. The human corpus luteum did not produce a hormone to relax the pelvic ligaments at parturition—another penalty women had to pay for the upright position. Multiparæ often had a recurrence of backache at the menopause. Diathermy to the cervix was sometimes useful in this trouble, restoring some function to the ovary. But endocrine disturbances in most cases did no more than provide a suitable soil for joint disturbances. Treatment of the menopause was mainly symptomatic: iodine, liquor sedans, and small doses of thyroid were useful in suitable cases. Vasomotor symptoms were relieved by œstrin. Suggestion was a factor in the use of modern endocrine preparations. Menopausal women usually had an excess in the blood of the hormone found in the urine of pregnant women and this preparation was not, therefore, of any use. Valerian had a real sedative influence on the autonomic nervous system. The psychological part of the treatment must never be forgotten; often a time of retreat was desirable while the endocrine system settled down to a new and more stable equilibrium.

Dr. A. P. THOMSON analysed the cases coming to him as a general physician. The neglect of the subject in text-books was surprising. The best review of the subject was that published by the Medical Women's Federation in 1933. This had shown that 15 per cent. of women had no symptoms, while 10 per cent. were definitely disabled. The most numerous intermediate group presented the symptoms of an ordinary anxiety neurosis: the fear that their attraction and value would disappear and the fear of cancer. Among the poor the menopause was often welcomed. In a large group the symptoms of thyrotoxicosis threatened and came to nothing; radical treatment should be advised only with very great caution. Permanent thyroid changes dated from the menopause in rather less than 2 per cent. of the women reviewed by the Medical Women's Federation. The results of psycho-analysis in Dr. Thomson's cases had been bad. Women were frequently referred to him on the threshold of some gynæcological intervention to see if the heart would stand it. The murmur was usually due to simple anæmia and the patients were quite well in a month or two, their hæmorrhage and other menopausal symptoms having disappeared with rest and tonic treatment. He suggested that no woman should be submitted to operation until simple medical measures had been tried. Some doctors had an odd faith in insulin for uterine hæmorrhage; if insulin really inactivated œstrin diabetics would have menorrhagia instead of the usual amenorrhœa! A simple and

valuable treatment was bleeding, which had been widely used in the sixteenth century, and certainly relieved flushing, especially if there was hyperpiesis. The most important late symptom was obesity; it occurred twice as often in married women as in single ones. This seemed to relate to their greater ability to take care of themselves, whereas the single woman had to carry on. An arthritis of the knees might occur in women at the menopause who became fat, owing to wear and tear; but Dr. Thomson had never seen a case in a thin woman. The psychotic group represented the physician's failures. Quite a large number of alcohol and drug addictions began at the menopause.

THE PITUITARY AND OVARIAN RELATIONSHIP

Dr. P. M. F. BISHOP said that the gradual decline of ovarian activity was undoubtedly the starting-point, and a compensatory over-secretion of prolan A followed. It seemed logical to treat with œstrin, and this had met with some success. The symptoms, however, were not due to withdrawal of œstrin but to the presence of prolan A; they did not appear until four or six weeks after oöphorectomy. The prolan A curve ran more or less parallel with the hot flushes. Estrin damped down the prolan A production. When both prolan A and œstrin were absent from the urine, hot flushes never appeared. Propylactic treatment seemed highly undesirable. The object of œstrin administration was not to cut out prolan A altogether but to keep it down and let the patient become gradually accustomed to higher and higher levels of it. There was usually no need for high doses or injections, or of œstrin estimations. Doses of 500-1000 international units were generally sufficient; and the flushes themselves were a good enough indication of the imbalance. Patients often said they felt well during œstrin treatment; and a valuable change of mental attitude was sometimes effected thereby.

Dr. F. STOLKIND thought reassurance was very valuable treatment. Endocrine preparations by mouth were waste of time and money and the results from injections were probably psychological. He had not seen any benefit from diathermy to the cervix, bleeding, or psycho-analysis.

Dr. A. H. DOUTHWAITE agreed that menopausal arthritis of the knees was simply an osteo-arthritis related to the increased weight, but questioned whether there were not also a true rheumatoid arthritis related to the menopause, less crippling than in younger people and very resistant to treatment. Complete achyria often suggested chronic gastritis in these cases and the blood uric acid was above normal, though lowering it did not relieve the symptoms. Venesection did relieve symptoms if hyperpiesia was present.

Dr. PHILIP ELLMAN mentioned a syndrome of obesity, arthritis, and hypertension in women with definite hypothyroidism. The disturbance of equilibrium due to excessive fat produced the joint changes. Astonishing results were obtained by thyroid medication, especially relief of the arthritic symptoms. Menopausal acromegaly was another syndrome, and in one case had been repeatedly relieved by intrapelvic diathermy—possibly for psychological reasons. The syndrome of obesity, hypertension, and hypothyroidism was not an uncommon late sequel of artificial menopause with removal of the ovaries.

Sir WALTER LANGDON-BROWN, in reply, agreed that many women looked forward to the menopause as a chance of pursuing their intellectual interests

without interference. Cancerophobia was one of the commonest diseases of the day. The high percentage of achlorhydria was probably a factor of increasing age. Psychological treatment was of the greatest importance but formal psycho-analysis was likely to do more harm than good.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY

A MEETING of this society was held in Sheffield on Feb. 28th, with Dr. RUTH NICHOLSON, the president, in the chair. A joint communication on

Radium Treatment of Carcinoma of the Cervix

was made by Prof. W. FLETCHER SHAW and Prof. DANIEL DOUGAL. They had been struck by the fact that although radium treatment of carcinoma of the cervix had been practised in this country for many years, there had been singularly few reports based on five years' freedom from recurrence. The staffs of institutions where radium treatment was carried out had stated that they were obtaining good results but had not as yet published any figures comparable with those from foreign clinics. On the other hand, the results likely to be obtained by the Wertheim operation were well known. Unfortunately this operation entailed both a high immediate mortality and a long and trying convalescence, and for this reason most gynæcologists would undoubtedly have been prepared to abandon it if convincing evidence had been produced by the radiologists that radium treatment could give equally good results. Such evidence had not as yet been forthcoming in this country and for this reason Prof. Shaw and Prof. Dougal had determined in 1928 to purchase their own supply of radium and to treat their own cases both in private and in hospital. As this step was in the nature of an experiment, it was decided to treat all cases by the same method and to follow up every case with the idea of publishing results as soon as a sufficient number had been collected.

After due consideration the method of Heyman of Stockholm had been chosen, with certain modifications suggested by Dr. Helen Chambers and Prof. S. Russ of the Middlesex Hospital. Forty milligrammes of radium, suitably screened, was inserted into the uterine cavity and 60 mg. in three box applicators was applied to the cervix and vaginal fornices. Each patient was treated on three occasions for 24 hours, with an interval of one week between the first and second application and three weeks between the second and third application. The cases treated up to Jan. 1st, 1931, numbered 94, and the results five years later were:

Alive and well five years later	39 (41.4%)
Dead or untraced	55 (58.6%)

The immediate mortality was 2.1 per cent., one patient having died from peritonitis and one from pulmonary embolism. Microscopical confirmation had at first not been carried out in advanced cases, because the diagnosis in such cases was deemed to be so definite to an experienced clinician that confirmation was unnecessary. Later, when it was realised that readers of the report would not have seen the cases, and would have to accept the diagnosis on the authors' unconfirmed statement, a piece of growth was excised for laboratory examination as a routine. Microscopical examination was therefore carried out in about half the cases; but those not so examined were so advanced that no error in diagnosis was possible.

In considering the results with regard to the stage of the growth, the classification of the radiological subcommittee of the League of Nations Cancer Committee had been adopted.

Stage.	Cases.	Alive.	Dead.
I.	11	7	4
II.	27	12	15
III.	40	17	23
IV.	10	1	9

Six cases were unclassified.

Two patients with cervical stump carcinoma following subtotal hysterectomy were included, and both died of recurrence. These cases should perhaps have been omitted, for it had obviously not been possible to follow the full routine as regards application.

In considering the question of radium versus the Wertheim operation, the results in the present series (94 cases with 41.4 per cent. of five-year cures) could be compared with the surgical results of Bonney (384 cases with 39 per cent. five-year cures) and Fletcher Shaw (154 cases with 38.3 per cent. five-year cures). The operability rate had also to be taken into consideration (Bonney 63 per cent.). Prof. Shaw and Prof. Dougal considered their series a small one; whether the high percentage of freedom from recurrence would be maintained when they had larger figures remained to be seen. But they were convinced that the results with radium were better than those with Wertheim's hysterectomy. At the same time they were by no means satisfied with figures which showed less than half the patients alive after five years. Certain of their patients were now having deep X ray therapy after radium treatment, but this had been done for too short a time to allow of any comparison of results. They were convinced that the surgical treatment of carcinoma of the cervix was a thing of the past.

The PRESIDENT congratulated Prof. Shaw and Prof. Dougal on the excellence of their results. She read on behalf of Mr. P. Malpas the figures from the Liverpool Radium Centre, of cases treated during the years 1929 and 1930, the total five-year survival-rate of all cases treated being 33 per cent. The method used was that of Heyman, followed by deep X rays.

Mr. J. W. BURNS asked if any of the patients had suffered from annular constriction of the rectum after treatment. He had observed the condition in 2 cases. He also expressed the view that radium therapy was well worth while even in very advanced cases, since it relieved pain and made the end easier.

Mr. T. F. TODD commented on the excellence of the results obtained, which he regarded as far and away ahead of anything else so far achieved. Except for one single year's results from the Marie Curie Hospital, he knew of nothing comparable in the international literature. He considered radiation definitely preferable to surgery even in early cases; at least eight of the international radium centres had published a five-year survival-rate of over 50 per cent. in operable cases—i.e., 10 or more per cent. better than surgery. Mr. Todd recalled Beckwith Whitehouse's published figures of 500 cases treated at several teaching hospitals in this country, with a five-year survival-rate of about 11 per cent.

Dr. FRANK ELLIS gave figures from the Jessop Hospital for Women, Sheffield, showing a 30 per cent. five-year survival-rate. It was customary in Sheffield to perform Wertheim's operation on Stage I. cases (if fit for operation) after preliminary radiation. If the tumour was bulky and infected the patient had (1) X ray treatment for two weeks to the whole pelvis; (2) two weeks' rest with douches; (3) radium; (4) one day later, Wertheim's operation; and

(5) further X ray treatment to the whole pelvis if glands were found to be involved. If the tumour was small and uninfected, the procedure was: (1) single dose of radium; (2) one day later, Wertheim's operation; and (3) a full course of X rays to the whole pelvis if glands were involved. Cases in Stages II., III., and IV. were given X rays, radium, and then X rays again. Dr. Ellis showed a series of slides, indicating the technique of the methods employed; also a slide to show the type of X ray burn of the skin, which while healing perfectly might be thought by the uninitiated to indicate an overdose—being in reality the dose aimed at. He also quoted Döderlein's figures in operable cases which showed 80 per cent. five-year cures after complete radiation, as compared with 46 per cent. after operation. They afforded adequate reason for Döderlein having given up the operative procedure.

Dr. E. A. GERRARD drew attention to the excellence of the results in a series of cases which had been handled entirely by gynæcologists, without resort to their radiological colleagues. Was this a point of importance—even significance? He thought so, particularly as there was a growing tendency in certain areas for the general practitioner to refer malignant cases directly to the radiologist. Was this in the best interests of the patient? The radiologist could hardly be expected to have had a wide experience in a special branch like gynæcology. The diagnosis in carcinoma of the cervix, particularly of the endocervical type, was not always easy, and the correct application of the radium was liable to present real difficulty unless the operator was regularly engaged in vaginal surgery.

Mr. J. E. STACEY advocated Wertheim's operation in first-stage and early second-stage cases—along with radiation, as this precluded the ill-health from cystitis, proctitis, &c., which was liable to follow if radiation alone were employed. He believed that coöperation between gynæcologist and radiologist was advisable; the gynæcologist should diagnose the condition and the radiologist should decide the dose and apply the treatment.

Prof. MILES PHILLIPS also advocated the coöperation of gynæcologist and whole-time radiologist. He laid stress on the necessity of doing all one could to prevent carcinoma by the ruthless removal of the cervix whenever it was found in a badly damaged or chronically infected condition. The fact that the annual mortality-rates showed, for a number of years, a steadily falling death-rate from cancer of the uterus, whereas that from cancer in all other organs was increasing, was at least highly suggestive that this method of preventive treatment was becoming effective.

Dr. I. A. B. CATHIE spoke of the grading of tumours as an aid to prognosis. He was inclined to disagree with the prevalent idea that the columnar-cell type of growth was resistant to irradiation.

Prof. DOUGAL, in reply, said that Prof. Shaw and himself, recognising that their series was a small one, realised that they might have been fortunate in their results. He agreed with Mr. Todd that there was now no justification whatever for the Wertheim operation. He had seen one case in which application of radium had been followed by a fistula, but the dose given had been unduly high—11,000 mg.-hours. He held that coöperation between surgeon and radiologist was undoubtedly desirable, though the dose for carcinoma of the cervix was largely standardised. He did not think that a radiologist was the best person to apply the radium in this region, for even

an experienced operator sometimes found great difficulty in advanced cases with the insertion of the intra-uterine portion of the dose.—Prof. DOUGAL agreed with Dr. Cathie that the columnar-cell type of growth was proving to be less resistant to radium than had been thought in the past.

Naegele Pelvis

Dr. CLANCY reported the case of a 6-gravida who had had two stillbirths and three live children, all by instrumental deliveries. After the first delivery there had been paralysis of the left leg. She was admitted to hospital at the thirtieth week and on vaginal examination the membranes were found to have ruptured. The cervix and vaginal vault exhibited marked laceration indicating severe trauma at previous deliveries, and in view of this fact, it was decided to have a radiogram taken. This revealed a Naegele pelvis, of which there had been no indication by vaginal or other examination. The external appearance of the patient was also normal, and neither figure, gait, or carriage gave any suggestion of deformity. The following measurements were taken: interspinous, 8½ in.; intercrural, 9½ in.; external conjugate, 6½ in.; external obliques, 7 and 7½ in.; posterior superior spine to symphysis on each side, 6½ in.; spine of last lumbar vertebra to anterior superior spine, 6½ and 6½ in. On examination of the patient's back a definite bony lump was found over the sacro-iliac joint on the affected side. The striking feature of these cases was the difficulty in diagnosis; for apart from the bony lump there was nothing to indicate the serious deformity. The customary measurements, as stated by Whitridge Williams, merely suggested a justo-minor pelvis. Dr. Clancy felt that there was much to be said for having a radiogram taken wherever there was a history of former dystocia.

The PRESIDENT spoke of the rarity of spontaneous delivery in the type of case, also the high mortality recorded—Litzmann, 22 deaths in 28 cases.—Dr. J. W. BRIDE referred to the temporary paralysis of the leg from which the patient had suffered after the first delivery. It was remarkable that nerve injury should be so rare even after difficult instrumentation.—Prof. PHILLIPS said that this case showed the desirability of all maternity hospitals being provided with an X ray apparatus.

Malignant Ovarian Tumours and Hysterectomy

Mr. C. H. WALSH showed a specimen of calcified fibroids associated with malignant pseudomucinous ovarian cyst and adenocarcinoma of the body of the uterus with hæmatometra.

The patient was a nullipara, aged 66, who had passed the menopause at 52, since when there had been no vaginal discharge. She had been perfectly well until the day before she was admitted to hospital for severe abdominal pain and vomiting. The pulse, respiration, and temperature were normal, but abdominal palpation revealed a hard mass in the right iliac fossa and a cystic tumour in the left side of the abdomen. The cervix felt normal and there was no vaginal discharge. In view of a possible diagnosis of carcinoma of the colon, a barium meal was given, and on radiography a calcified mass was seen in the right iliac fossa, which had the appearance of a calcified fibroid. The cystic mass was thought to be ovarian in origin, and a laparotomy was performed. There was no ascites. The uterus contained multiple fibroids, and the large calcified tumour seen in the radiogram was found to be a pedunculated fibroid, arising from the right side of the fundus uteri. The swelling on the left side was an ovarian cyst the size of a

football. Total hysterectomy with bilateral salpingo-oophorectomy was performed, and on incising the uterus after operation the surgeon was surprised to find it full of malignant growth and distended by about 6 oz. of blood-stained fluid. The tubes were also found to contain several malignant nodules, but in no instance had the growth reached the peritoneal surface. The ovarian tumour proved to be a papillary pseudomucinous cyst adenocarcinoma.

Prof. FLETCHER SHAW, in advocating removal of the uterus in all cases of malignant disease of the ovaries, recalled a case which supported the view that the growth in the uterus was secondary to the one in the ovaries. The patient, aged 39, had had double ovarian carcinomata—each the size of an orange and both free from adhesions. These were removed and the uterus retained; but after the operation the patient had amenorrhœa for 18 months, succeeded by irregular and increasing bleeding. About two years from the first operation, the irregular hæmorrhage having been present for about six months, panhysterectomy was performed and an advanced carcinoma was found in the interior of the uterus. If the growth had been primarily in the uterus it was hardly possible for it to have remained quiescent and for the woman to have 18 months' amenorrhœa after the removal of the ovaries. If, as seemed more likely, the uterine growth was secondary to the ovarian, it must have been in an early stage when the ovarian growths were removed and have progressed slowly, for hæmorrhage began only 18 months later. The first operation was in 1912 and the second in 1914, and the patient was alive now, 24 years after the first operation.

Dr. ELLIS thought it an advantage when operating on these cases to leave the uterus with a view to subsequent radium therapy. He quoted a recent paper by Schroeder giving results of treatment of a relatively large number of cases of proved malignant disease of the ovary treated by radiation. Schroeder divided his cases into three groups: (1) those in which he was able to remove all visible growth; (2) those in which most of the visible growth was removed; and (3) those in which only a portion of the growth was removed for biopsy. The five-year cures were 66 per cent. in Group 1 and 16 per cent. in Group 2. The latter was, however, subdivided into two sub-groups. In first of these the uterus was not removed, so that it was used afterwards for intrapelvic application of radium in addition to the X ray treatment which all the patients received; the five-year survival-rate was 25 per cent. In the second, in which the uterus was not left and therefore radium was not applied, there were no five-year survivals. These figures indicated the advisability of supplementing operation with radium as well as X ray treatment, with the corollary that it was advisable to leave the uterus in position if all obvious growth was removed.

Mr. BURNS referred to a case in which a malignant ovarian tumour, the size of an orange, was removed and the patient had no symptoms for two years. After this time, uterine hæmorrhage occurred, and curettage showed a growth similar to that of the ovary. A dose of 2000 mg. hours of radium was given, and the patient had no further symptoms. Curettage 18 months later revealed merely fibrous tissue.

Mr. C. R. MACDONALD showed a specimen of acute torsion of a hydrosalpinx in pregnancy.

Dr. BRIDE reported two cases of unusual Ectopic Pregnancy.

REVIEWS AND NOTICES OF BOOKS

An Enquiry into Prognosis in the Neuroses

By T. A. ROSS, M.D., F.R.C.P., sometime Medical Director, Cassel Hospital for Functional Nervous Disorders. London: Cambridge University Press. 1936. Pp. 194. 10s. 6d.

THIS book presents a serious attempt to find out what really happens to patients who have been treated for neuroses. The after-histories of nearly 1200 patients treated at the Cassel Hospital have been investigated, and, as the first cases were treated in 1921, many have now been followed up for over ten years. Forty-five per cent. of all the cases were well one year after discharge; 25 per cent. were improved; 19 per cent. had not benefited, while the remaining 11 per cent. were lost sight of. Of 850 patients, investigated five years after discharge, 502 were lost sight of, 290 were well, and 58 were improved. In 1934, only 134 of the 1186 patients were known to have relapsed. Dr. Ross states that many patients who reported themselves as improved in the earlier years after leaving hospital reported themselves later as being well. The average duration of stay in hospital increased gradually from 2.3 months in 1921 to 7.2 months in 1933. The best results were obtained in 1930 when the average duration of stay in hospital was 4.4 months. In this year 63 per cent. of the patients were well a year after discharge. Dr. Ross also reports his investigations into the prognosis as regards suicide and insanity. Patients known to have committed suicide numbered 7; and 23 patients were known to have become psychotics. The names of the "lost" patients were sent to the proper authority, and it was found that 10 had been certified and 16 had been received into mental hospitals as voluntary patients. From these figures Dr. Ross concludes that the prognosis with regard to becoming insane is good.

Dr. Ross's writings on the neuroses make a general appeal, for he uses simple language which all can understand. His methods of treatment are also simple and can easily be made use of by the practitioner. He is strongly critical of the Freudian school in their insistence on the need for prolonged analysis; whereas the Freudian analysts maintain that simple methods, such as Dr. Ross advocates, only cause temporary relief.

The good results here reported suggest that the methods Dr. Ross advises result in permanent cures in a high proportion of cases of neurosis; they should be studied with care.

Pathology of Internal Diseases

Second edition. By WILLIAM BOYD, M.D., M.R.C.P. Edin., Professor of Pathology in the University of Manitoba; Pathologist to the Winnipeg General Hospital, Canada. London: Henry Kimpton. 1935. Pp. 904. 45s.

To bring this book up to date has involved 25 additions to the text, though only four years have elapsed since the first issue, and the revision or complete rewriting of 13 sections. The descriptions of the anemias, the diseases of the endocrine system, and pulmonary disease, among others, have had to be considerably altered. In spite of all this new material the volume has been increased by only 16 pages. This feat has been accomplished by the introduction of small type for some of the less common conditions and by shortening the chapter sub-

headings. We have here an attempt to bridge the gap which often exists between medicine and pathology, and the book should certainly help the student. The post-graduate student in particular will appreciate the references to recent work, which are now arranged under subject headings. A surprisingly large store of sound, well-balanced teaching is to be found in readable form in these pages.

1. Foundations of Short Wave Therapy

By Dr. WOLFGANG HOLZER, Assistant in the Physiological Institute of the University of Vienna; and Dr. EUGEN WEISSENBERG, Medical Superintendent of the Short Wave Section of the University Clinic for Nervous and Mental Diseases in Vienna. Translated by JUSTINA WILSON, F.R.C.P. Edin., D.M.R.E. Cantab., and C. M. DOWSE, B.Sc. Lond., A.M.I.E.E. London: Hutchinson's Scientific and Technical Publications. 1935. Pp. 228. 12s. 6d.

2. Short Wave Therapy and General Electrotherapy

Illustrated. By HEINRICH F. WOLF, M.D., Consultant, Department of Physical Therapy, Mt. Sinai Hospital. New York: Modern Medical Press. 1935. Pp. 96. \$2.50.

3. Néodiathermie à ondes courtes

By Dr. HENRY BORDIER and Dr. T. KOFMAN. Paris: J. B. Baillière et Fils. 1936. Pp. 139. Fr. 24.

1. IN our review (THE LANCET, 1935, ii., 1125) of the German original we noted that here is to be found the best presentation of the technical aspect of ultra-short waves available in book form. The translator of this section has kept closely to the text—a highly desirable feature where physical facts and theories are detailed, even though it leads him to speak of the principles of electric circuits as "connexion theory." Accuracy has been maintained throughout and the rare misprints lead to no confusion.

The second section, devoted to therapy, is relatively short. The translator has expanded it by printing the descriptions of cases in the same type as the general text, whereas in the original smaller type was used for clinical examples. Some redundancies have crept in: an "adipose" woman is translated as a "stout corpulent" woman, but the fact that the translation is more free has made it also more readable. This therapeutic section would have been improved if Dr. Wilson had felt free to make some additions from her own experience of the method. Every practical worker in short-wave therapy should possess a copy of this book.

2. Dr. Wolf's book of drawings show types of electrodes and methods of application to the various diseased organs. Practical hints are interspersed, some of which are aimed, wisely, at preventing further damage to the patient. The author continues to maintain a preference for the diathermy machine for treating whole limbs, while the valve apparatus is appropriate for the treatment of selected cases of acute local inflammation.

3. It was in France that the therapeutic application of high-frequency currents originated, for it was d'Arsonval, in 1891, who made possible the use of diathermy. This little book gives an account of the theory and practice of diathermy and of ultra-short

waves which is well balanced, concise, and yet very readable. French machines of commercial type are included and some space is devoted to the biological effects of high-frequency currents.

A Synopsis of Physiology

Second edition. By A. RENDLE SHORT, M.D., F.R.C.S., Professor of Surgery, University of Bristol; and C. I. HAM, M.B., F.R.C.S. Edin., late Demonstrator in Physiology in the University of Bristol. Edited by C. L. G. PRATT, M.Sc., M.D., Lecturer in Physiology, St. Thomas's Hospital Medical School. Bristol: John Wright and Sons Ltd.; London: Simpkin Marshall Ltd. 1936. Pp. 312. 10s. 6d.

THIS book should be an excellent tonic for students who complain that physiology is "so indefinite." It is crammed with facts from beginning to end, and even the reasoning is tabular. It is not, of course, intended by the authors to be used alone as a text-book, although it contains more information than many text-books; it is a present to the student rather than a contribution to physiology. A dangerous present, perhaps, for it would be a peril to any student into whose hands it fell more than three months before his examination. The reason for this is that the authors have done their work surpassingly well, so that the reader of the book does not require to think at all: this has all been done for him. If he has not done his own thinking previously he will inevitably bend all his energies to memorisation and his knowledge will be sterile. Physiology is a subject to be understood rather than learnt; it is the medical student's training in how to reason about the human body, a pursuit which will occupy him for the rest of his active life. Nevertheless, examinations must be passed, and there could be no better form of revision than reading through this book. It is an exhaustive summary, accurate in the main details, and the subject is not "simplified." The sub-headings of the various sections provide what no larger book can—namely, a bird's-eye view of the subject matter and a gratifying illusion of finality. It is strongly to be recommended to those who feel their confidence ebbing before an examination. It should prove even more useful to teachers of physiology, not because they will learn very much from it, but because it will help them to present their lectures in an orderly fashion by suggesting a plan. Knowledge does not always go hand in hand with the power of exposition, and no teacher need be ashamed of making use of the painstaking analysis whose results are presented in this synopsis.

Lectures on Diseases of Children

Seventh edition. By ROBERT HUTCHISON, M.D., LL.D., F.R.C.P., Consulting Physician to the London Hospital and to the Hospital for Sick Children, Great Ormond-street. London: Edward Arnold and Co. 1936. Pp. 452. 21s.

THERE can be few text-books that have provided generations of medical students with more agreeable or serviceable reading than Dr. Hutchison's famous lectures. The seventh edition of a volume so well known requires little comment. The lecture dealing with chronic constipation in infancy and childhood, and part of that concerned with pink disease, have been rewritten, but apart from this there have been only minor alterations. The style conveys a peculiarly personal quality, and the matter is compact of sound

judgment. The author specifically disclaims any intention of writing an exhaustive treatise on children's diseases, and the student must seek elsewhere for detailed descriptions of modern methods of diagnosis and treatment. For a wholesome reminder of the outstanding importance of clinical observation, the student can do no better than study Dr. Hutchison's lectures.

British Journal of Children's Diseases

(Vol. XXXIII., January-March.)—In an address entitled *Farrago Pyretologica: a Medley on Fevers*, recently delivered before the Nottingham Medico-Chirurgical Society, Dr. J. D. Rolleston stated that the study of fevers was so full of interest and importance that he had ventured to revive the term used in its Greek form by Richard Morton in 1692 for the title of his work on fevers. During the 35 years that Dr. Rolleston had been in fever practice he had witnessed a remarkable change in the incidence and severity of certain diseases, such as scarlet fever, small-pox, and enteric, as well as the appearance of new diseases such as encephalitis lethargica, encephalitis following measles and varicella, and summer typhus. New specific methods of diagnosis and treatment had been introduced, while others, especially the therapeutic use of alcohol, had been superseded or largely replaced. After discussing the Dick and Schultz-Charlton tests, and active and passive immunisation against scarlet fever as well as the antitoxin treatment, he maintained that four weeks' isolation was amply sufficient for an uncomplicated case, as had been recommended in a Ministry of Health report in 1927, though this recommendation did not seem to be generally known to the profession or the public. Chicken-pox was not always a trivial disease as it might give rise to serious and even fatal complications, and he had seen 6 deaths from it. He had never seen two attacks of measles in the same individual, nor a severe attack of rubella apart from one complicated by appendicitis and another by purpura hæmorrhagica. Like most observers with a long and intimate knowledge of the acute exanthemata, he had never encountered "the fourth disease," and declared that this term was more applicable to erythema infectiosum, sometimes known as "the fifth disease." It was still necessary to insist on making the diagnosis of diphtheria on clinical grounds, for he was constantly seeing cases in which valuable time had been lost, often with fatal results, because the practitioner did not send the child to hospital or inject antitoxin before he had received the report on the throat swab.—In a paper on the Mantoux Test in Children with Special Reference to Home Contacts, Dr. G. Gregory Kayne stresses the importance of some simple rules to guide the clinician in the use of the Mantoux test, and describes some points in the technique, routine procedure, and reading of the test. The significance of a positive and negative reaction in children is also described. Lastly, the usefulness of the test in the examination and handling of home contacts is considered.—Dr. Alair Chand, professor of medicine at the Amritsar medical school, contributes a paper on Chronic Jaundice in Three Brothers with Hypertrophic Cirrhosis of the Liver and Infantilism. The clinical features tallied in almost all respects with those of Hanot's cirrhosis. In the first case, that of a man aged 24, who died, signs and symptoms of portal cirrhosis appeared in addition to those of biliary cirrhosis a few months before death. No biopsy nor necropsy could be obtained. The other two brothers aged 16 and 12 were still alive.—In a paper entitled *A Seventeenth Century Cure for Rickets*, Dr. W. J. Rutherford comments on Sir Thomas Browne's statement in his *Account of the Birds Found in Norfolk* that about Norwich the livers of rooks were used for the cure of rickets.—The abstracts from current literature are devoted to treatment.

THE LANCET

LONDON: SATURDAY, MARCH 28, 1936

THE MIDWIVES BILL

At the opening of the Parliamentary session last December the Speech from the Throne referred to the need of improving the maternity services and promised legislation whereby local authorities, in coöperation with voluntary associations, would provide an organised service of salaried midwives. The pledge is redeemed by the Midwives Bill which the Minister of Health has now presented. It embodies the main points recommended by the Joint Council on Midwifery—the principle that every maternity case should be nursed by a qualified midwife, the prohibition on unqualified persons nursing maternity cases for gain, the establishment by local authorities of a salaried service in all areas not already served by salaried midwives, and the grant of compensation or pension to all midwives who either are not accepted for salaried service or are found unfitted by reason of age or infirmity. County and county borough councils (and in some cases county district councils) are by statute the "local supervising authorities." It is to be their duty to secure within their areas a sufficiency of certified midwives to attend on the parturient woman in her own home and to act as maternity nurse for at least ten days after childbirth. The authorities are to arrange with welfare councils and voluntary associations for the whole-time service of the necessary personnel or else to employ midwives direct. They are to formulate proposals in consultation with local organisations of medical practitioners and of midwives and with welfare councils and voluntary associations, and the resultant scheme is to be submitted to the Minister within six months of the Bill passing into law. Before a local authority first engages midwives for employment, it must advertise the prospective appointments and the proposed salaries and conditions. As every practising midwife in the district must receive this information, there is reasonable hope that as many as possible of the salaried posts will be filled by local midwives previously in independent practice—a course which will simplify the transition and alleviate hardship. Each authority is to fix scales of fees for the services of midwives and maternity nurses, and it will be charged with the duty of recovering the fees from the patient or her husband, subject to a discretionary power to remit in view of the financial circumstances of the particular household. The additional cost of the scheme to the ratepayers will be borne in part by the Exchequer through the mysterious but efficient formula of the block grant adjusted to local needs and population. As the Minister has power to reduce the grant in case of inefficiency,

the local supervising authority itself comes under supervision.

While the general standards of midwifery are being thus improved to the national advantage, it would be a pity if the national conscience had cause to feel uneasy over the fate of the midwives at whose expense the change is made. With the goodwill of the local authorities existing midwives can be absorbed in the new scheme, but there will remain a residue for whom the future holds anxiety. It is said that there are about 60,000 midwives on the roll and that only about a quarter of these are in actual practice; of this quarter roughly half are in salaried posts under voluntary nursing associations or otherwise, while the other half are practising independently. What with financial stringency, the fall in the birth-rate, and the increasing readiness of women to go into hospitals for their confinements, the midwife's calling is overcrowded, although as in other callings there is room for women of the best type. The Bill proposes to remedy this superfluity by the double process of buying out and weeding out. Under Clause 5 the midwife who surrenders her certificate within three years will be compensated with a sum equal to three times her average net annual emoluments; a midwife deemed incapable of efficient service by reason of age or infirmity of mind or body will be required to surrender her certificate (subject to a right of appeal to the Minister) and, on surrender, will be entitled to receive a sum equal to five times her average net annual emoluments. The number of women who, under these two processes, will be eliminated from practice is officially estimated at less than 3500. When due allowance has been made for a frugal reluctance to subsidise the so-called inefficient out of the public purse, the fact remains that most of these women paid for their own training and all have played their modest part in serving generations past, present, and future. The women who disappear from practice under Clause 5 can never be restored to the roll; they will commit a criminal offence if in future they act as midwives or maternity nurses. Section 3 of the Dentists Act was far more tender to the existing practitioner. Statistics, so far as available, indicate that a large majority of midwives have been earning less than £100 a year; one-third of them earn £50 or less; only one in seven earns £200 or more. When bad debts and professional expenses, food, and rent are deducted from these gross totals, the net annual sum (on which the compensation will be computed) is exiguous. Some 550 midwives in independent practice, it is believed, are over 60 years of age. They cannot have put by much against a rainy day. The Bill not ungenerously accepts the principle of compensation for this disappearing class of workers; its individual application will be scrutinised anxiously by those concerned.

As for the rest of the Bill, there is an excellent proposal that rules framed by the Central Midwives Board may require midwives to attend periodical courses of instruction arranged by the local authority of the district, and may also permit the Board to grant diplomas to midwives presenting

themselves for examination in the teaching of midwifery. The Minister of Health may prescribe the qualifications of persons appointed by a local authority to supervise the midwives practising within the area; nobody is to be appointed who does not possess the prescribed qualifications. Lastly there is a significant little clause which will give the Minister a power denied to him by the Court of Appeal last year. Under Section 14 of the Midwives Act of 1918 a midwife in cases of emergency can call to her assistance a medical practitioner. The Act says the local authority shall pay the medical practitioner a fee on a scale fixed by the Minister. In the Monmouthshire County Council case it appeared that not only did the Minister fix the scale of fees as Parliament said he might, but he also added conditions. The conditions involved the possibility that a doctor might do the work and yet not get the fee. The Court of Appeal found no power in the section for the Minister to do anything but fix a scale. Four doctors, advised by the two medical defence societies of which they were members, successfully claimed their fees in spite of the Minister's conditions. There was talk of the Minister taking the case to the House of Lords; he has found a simpler method of getting his way.

HYPERPYREXIA IN THE TREATMENT OF GONOCOCCAL INFECTIONS

DURING the past few years much experimental work has been done, chiefly in the United States, on the treatment of certain infections by physical methods which produce an increase in the general body temperature over a period of hours. Some have modified the old radiant heat bath, while others induce pyrexia by means of diathermy, short (wireless) waves, or inductothermy. It was evident from the views expressed at the Conference on Fever Therapy held at Dayton, Ohio, last year, that opinions differ greatly about the best type of apparatus, the most effective methods of applying the treatment, and the pathological conditions in which benefit may be expected. Nevertheless on some points there is a remarkable unanimity, and reports from many quarters show that the results in gonococcal arthritis may be excellent and even spectacular. Dr. NEYMANN,¹ of Chicago, speaking at the Royal Society of Medicine last April, said he could find no exception to the widespread belief that electropyraxia is the treatment of choice in such cases, and the same phrase is used by KENDELL, WEBB, and SIMPSON,² who report good results in 31 cases of gonococcal arthritis treated in the Kettering hypertherm—an air-conditioned cabinet in which the humidity can be controlled.

Among the forms of therapy now adopted is the combination of general hyperpyrexia with local application of the diathermy current to the pelvic focus of infection; and BIERMAN and

LEVENSON³ regard this mixture of old and new methods as a definite advance. Their practice is to place the patient in a water bath at 100–102° F. and gradually raise the temperature to 107–108°. By this means it is possible, within an hour, to bring the rectal temperature up to about 105° F., after which pyrexia of about 105.5° can be kept up without difficulty for five or six hours by transference to a bed covered with a hood made of insulating material and containing a battery of 60-watt electric light bulbs. Additional pelvic heating is obtained by the diathermy current, the active electrode (water-cooled if necessary) being inserted into rectum or vagina and the dispersive electrode being applied in four sections covering a wide area of skin. In this way, it is found, a temperature of 111° can be maintained in the pelvis for as long as 3½ hours. Of 16 patients treated (8 male and 8 female), 13, it is stated, had complete restoration of function, and in the other 3, who had already suffered irreversible joint changes, some improvement was recorded. The women required an average of 2.1 treatments the men 3.5, and the intervals between treatments varied from two to thirteen days. The best results were obtained in early acute cases.

The use of heat in the treatment of metastatic complications of gonorrhœa is by no means new, and has been practised in various forms for many years. Hence the conservative may argue with some reason that hyperpyrexia is merely a variation on an old theme; and there is no doubt that excellent results are commonly obtained by well-tried methods, without the additional discomforts and risks involved in exposure to high temperatures for a long period. Nevertheless there is at least one feature of these recent investigations which deserves close attention—namely, the frequent reference made to the rapidity with which gonococci disappear from the discharges and purulent secretions themselves subside when these more drastic methods are employed. STUHLER⁴ says that urethral discharge sometimes ceases, and smears are often negative for the gonococcus, after the first session of fever therapy, and he makes the remarkable claim that fever therapy for gonococcal infections is one of the greatest advances made in the last fifty years—an advance “of even greater importance to the clinician than was the discovery of the gonococcus by Neisser in 1879.” In their latest paper⁵ STUHLER and his colleagues review the results of treating gonorrhœa with the Kettering hypertherm during a period of nearly two years, and are able to say that of 76 patients who completed the treatment 68 were cured and 7 were improved, while only 1 failed to respond. The condition was in 36 cases an uncomplicated urethritis; in the remaining 40 there was a complication in addition; but the infection never spread in consequence of treatment. Two-day intervals were allowed between sessions of fever therapy, and as a precautionary

¹ Neymann, C. A.: Proc. Roy. Soc. Med., 1935, xxix., 151; see THE LANCET, 1935, i., 1102.

² Kendall, H. W., Webb, W. W., and Simpson, W. M.: Amer. Jour. Surg., 1935, xxix., 423.

³ Bierman, W., and Levenson, C.: Amer. Jour. Med. Sci., January, 1936, p. 55.

⁴ Stuhler, L. G.: Proc. Staff Meet. Mayo Clinic, 1935, x., 207.

⁵ Desjardins, A. U., Stuhler, L. G., and Popp, W. C.: Jour. Amer. Med. Assoc., Feb. 29th, 1936, p. 690.

measure the treatment was always twice repeated after the signs and symptoms had disappeared; but most of the patients required only five or six sessions for cure. Better results were obtained as technique improved and these latest data in no way modify the optimism of earlier reports. If the claims put forward are justified—if means can really be found to reduce the weeks of mental stress, incapacity, and danger associated with the acute stages of gonorrhœa to days or even hours—then STUHLER'S words are certainly not an overstatement. Meanwhile in this country, so far as we know, there has not yet been any organised attempt at investigation on similar lines. An inquiry of this kind might well commend itself to public health authorities and those engaged in the systematic treatment of venereal diseases in clinics throughout the country.

ACADEMIC FREEDOM

WE print elsewhere (p. 739) Lord RUTHERFORD'S account of the work done by the Academic Assistance Council and of how it is proposed to carry on such part of the work as seems likely to require to be done in the future.

The Academic Assistance Council consists of 36 men and women eminent in various fields of scholarship and science; 13 of them are fellows of the Royal Society (including the president and two past-presidents) and 6 are either members of the medical profession or research workers in the medical sciences. "Intellectuals" and "professors" are sometimes accused of showing little ability in practical organisation; the work done by this body of "intellectuals" is an instructive commentary upon that popular opinion. From the beginning they had to deal with a problem which stirred popular feeling, exciting generous and selfish emotions in about equal proportions. On the one hand a tale of cruelty and oppression

in foreign countries never fails to arouse sympathy. Less literary ability than was at the command of the Council would have produced a story fit to be adorned with headlines in the daily and evening press. It would have been a convenient safety valve for emotion, and, by wounding foreign susceptibilities, have postponed for ever any hope of reconciliation. On the other hand, the pecuniary rewards of learning and science in this country are not so abundant that the provision of opportunities for foreigners, who may be competitors for posts to which home-bred scholars looked forward, can be examined with complete impartiality. The dangers could have been avoided by the issue of completely colourless statements and emphasis upon the temporary character of much help given. The result would have been general indifference. The Council have had the wisdom and skill to avoid wholly the dangers without lapsing into a policy of mere hand-to-mouth charity. They have, without using language which could give reasonable offence to foreign governments or nationals, made plain the tragic circumstances of many who have deserved well of all who value intellectual liberty, and in their practical policy have given no grounds for local jealousy. An organisation has now been created fit to cope with the difficulties of the future and all will wish success to the proposal to put it upon a permanent basis.

All will hope, not least the members of the Council, that the time will come when the interest of the Society for the Protection of Science and Learning will be purely historical. Unfortunately the state of the world holds little prospect that the hope will be realised in the near future, and we trust that the new society will be generously supported by members of a learned profession which in its long history has too often suffered from the want of intellectual freedom.

ANNOTATIONS

MEASLES IN LONDON

ATTENTION was drawn on p. 692 of our last issue to the rapid increase in the number of cases of measles under treatment in the fever hospitals of the London County Council. The total number of patients in the measles wards is now over 3000. During the week ended March 24th 964 fresh cases of measles were admitted, and on one day (March 23rd) as many as 178 cases. The number under treatment at one time has not yet reached the maximum of the last epidemic when, on a day in April, 1934, 3696 measles patients were being cared for in these hospitals. In that epidemic, notable prevalence, as reflected in the occupied beds, commenced a fortnight earlier than upon this occasion, and although the epidemic must be approaching its climax, it is not possible to say that this has in fact been reached. The later start is all to the good, because it implies more favourable seasonal conditions during the phase of maximum prevalence; we learn that the incidence of broncho-pneumonia is not notably high, and that in this respect the epidemic compares well with the last. In 1933-34, concurrently with measles, diphtheria and scarlet fever were also very prevalent. There is at the present time no undue prevalence of

these other common infections of childhood, and this is fortunate because, although the London County Council possess ample reserves of accommodation, there is a shortage of nursing and domestic personnel. Now that the need for temporary additional assistance has been made known in the press it will doubtless be met, although this authority is not alone in experiencing difficulty in obtaining nursing and domestic staff at the present time.

VITAMIN B₁ BY INJECTION IN TREATMENT OF NERVOUS DISEASES

At a meeting of the Edinburgh Pathological Club last week Dr. W. Ritchie Russell read a paper¹ on the parenteral administration of vitamin B₁ in polyneuritis and other conditions. He obtained supplies of the vitamin from Messrs. Hoffmann-La Roche for clinical trial and used them in the treatment of diseases in which there was evidence of degeneration of the peripheral nerves. Cases of chronic progressive polyneuritis, alcoholic neuritis, and subacute combined degeneration of the cord were treated. All of them showed peripheral sensory loss of the glove

¹ To appear in May issue of the *Edinburgh Medical Journal*.

and stocking type, and Dr. Russell found that injection was followed within a day or two by shrinkage of the area of sensory loss. As the treatment was continued the anaesthesia and weakness in the limbs quickly diminished, and he believes that the improvement occurring rapidly in the nerves that were least degenerated is similar to the rapid recovery obtained by injecting the vitamin in animals suffering from B₁-deficiency. The longer nerves, which are severely degenerated, can of course recover only gradually. In some of the cases reported the patients had been taking vitamin B₁ by the mouth previously without any good effect, and the striking improvement after parenteral administration suggests that in such persons the vitamin is destroyed in the alimentary canal or is for some other reason not absorbed. The two advantages of injection to which Dr. Russell drew attention are (1) that it overcomes this possible "conditioned deficiency" due to failure in absorption, and (2) that it produces a quick response which is of value in diagnosis because it demonstrates that the patient is really suffering from a lack of the vitamin. Anorexia of long standing sometimes responded to a single dose.

INCAPACITY AND LIGHT WORK

THE insurance doctor is constantly called on to decide when a patient who has been in receipt of sickness or disablement benefit should no longer be certified as incapable of work. It would of course be impracticable to place upon the expression "incapable of work" so narrow a construction as total inability to carry out any of the physical or mental processes that constitute work, and in the handbook for the guidance of approved societies the advice is given that an insured person should properly be regarded as satisfying the statutory condition of being "incapable of work" if he is in such a condition, through some specific disease or bodily or mental disablement, that an attempt to work would be seriously prejudicial to his health. Further, although a person who is admittedly unable for the time being to follow his ordinary occupation may not necessarily be rendered unfit for some other and less exacting form of work, he may properly be regarded as incapable of work if it appears probable that he will soon be able to resume his former work, and it would therefore be unreasonable to expect him to undertake any other form of work in the meantime. But if it becomes clear in the course of the illness that there is no reasonable prospect of his becoming fit for his ordinary occupation the society are advised to consider whether the man's physical and mental condition is such that he is capable of performing other remunerative work of such a character as a man of his training, education, and experience could reasonably be expected to undertake. If the man (or woman) can be so regarded benefit should not continue to be paid after the insured person has had a reasonable time in which to adapt himself for a new form of employment.

Here enters the problem of "light work." It is one thing to say the insured person is fit for light work, but it is another thing for him to be able to obtain it. And, as Dr. J. P. Steel points out in relation to compensation cases, the difficulty is greater when the labour market is overstocked. At the last panel conference the Insurance Acts Committee put forward a recommendation that where an insured person is considered by his doctor to be fit for work, but not fit for his former occupation, the doctor might give an indication to this effect in his next certificate by the insertion in the remarks column

of the words "(?) alternative employment." It had previously been proposed that when a patient was likely to be fit for some employment but was not likely ever, or for a long period, to resume his previous occupation, this fact might be indicated to the society in the form of an inquiry as to what action the society proposed to take in the particular case. This was regarded as open to objection as a possible infringement of professional secrecy. One difficulty in dealing with this type of case is that, when an insured person is permanently incapacitated for his ordinary work although no longer completely disabled, certain approved societies are apt to stop payment of benefit the moment the practitioner indicates his fitness for some kind of work. Other societies willing enough to deal with cases more liberally are met with the difficulty that in many areas there may be no alternative employment. An entry on a certificate, as was remarked at the conference, does not turn a blacksmith into a waiter. Dr. Steel is dealing specially with persons in the transitional stages between incapacity following an accident and complete recovery therefrom. But the provision of light work, or of alternative employment, is common to both problems.

REPEATED ABORTION

DURING the luteal phase of the ovarian cycle the uterine muscle loses its spontaneous contractility and becomes relatively insensitive to posterior pituitary extracts. From this it is deduced that the corpus luteum maintains the uterine quiescence that is essential for retention of the developing embryo during early pregnancy. Assuming that habitual and threatened abortion sometimes results from undue uterine motility various workers¹ have advocated the prophylactic or therapeutic use of the corpus luteum hormone progesterin in such cases. Finding that 1 rabbit unit of progesterin can inhibit human uterine contractions on the seventh day post partum, Falls, Lackner, and Krohn² have been giving 1 rabbit unit twice daily in cases of threatened abortion until the symptoms subsided or the patient aborted, and a similar dose twice weekly from the time of diagnosis of pregnancy until the 32nd week in cases of habitual abortion. In a series of 41 cases they report only 7 failures, and these results are in general agreement with those of other workers, though there is elsewhere a tendency to give more frequent doses, in the habitual abortion group, during the early months of pregnancy when this type of abortion is commonest.

Despite the success claimed for this treatment, however, there may well be other factors—excluding such organic causes as syphilis—responsible for habitual abortion; and of these a deficiency of vitamin E is possibly the most important. Attention was first drawn to this stable, fat-soluble vitamin, present in high concentration in wheat-germ oil, by H. M. Evans and K. S. Bishop in 1922. Lack of this factor in the diet of male rats results in irreparable degeneration of the germinal epithelium of the testis; in pregnant females it leads to death of the foetus; and though in non-pregnant females no degenerative changes have been found in the ovaries such animals are said to suffer from a transient, relative sterility. The interesting observation has also been made, by Hill and Burdet in 1932, that

¹ Wolfsohn, H.: *Med. Welt.*, 1932, vi., 1616; Weinzierl, E.: *Med. Klin.*, 1933, xxix., 563; Bishop, P. M. F., Cook, F., and Hampson, A. C.: *THE LANCET*, 1935, i., 439.
² Falls, F. H., Lackner, J. E., and Krohn, L.: *Jour. Amer. Med. Assoc.*, Jan. 25th, 1936, p. 271.

the "royal jelly," the food juice of the future queen bee, is an abundant source of vitamin E, whereas the food of the sterile working bee is lacking in it. In 1929, investigating the diets of 206 sterile women, D. Macomber found them lacking in fat-soluble factors, and noted that when this deficiency was rectified 40 of the women became pregnant. In this country Dr. Evan Shute³ has lately reported that the blood-sera of 70 per cent. of women aborting spontaneously displayed an abnormal resistance to proteolysis when exposed to tryptic solutions, and states that administration of vitamin E restored the normal proteolytic action of trypsin. In Canada Watson⁴ has succeeded in bringing pregnancy to term in 75 per cent. of a series of 43 cases of threatened or habitual abortion by treatment with vitamin E. And others report similar experiences.

What part this factor plays in the maintenance of pregnancy has not yet been explained. Apparently it has no direct influence on ovarian activity, for there are no demonstrable degenerative changes in the ovaries in its absence, nor, as has been shown by Saphir,⁵ will it produce cornification of the vagina if injected into castrated adult rats, or activation of the ovaries of infantile rats, or luteinisation of the ovaries of infantile rats previously sensitised with a follicle-stimulating extract. On the other hand, by injecting into oestrous rabbits extracts derived from vitamin E-deficient pregnant and non-pregnant rats, Rowlands and Singer⁶ have shown that such extracts are less able to cause ovulation than pituitary extracts from normal rats. This suggests that vitamin E helps to maintain the normal activity of the corpus luteum during early pregnancy, not by direct action on the ovary, but by stimulating the gonadotropic function of the pituitary. If this is so, then the essential cause of habitual abortion is relative deficiency of the corpus luteum hormone—a deficiency which might be rectified either directly by injecting progesterin or indirectly by giving vitamin E to encourage the pituitary to produce its luteinising factor, or by administering the luteinising hormone (prolan) of pregnancy urine.

SCURVY: OVERT AND LATENT

ADULT scurvy is so rarely seen in this country that there are few opportunities for its investigation. Such cases as occur are usually in food faddists or men living alone, and a typical example of the latter class is described by Drs. Archer and Graham in a paper we publish this week. The patient, an unemployed man, was living by himself on the tiny income of 17s. 6d. a week. He budgeted very carefully, but his total weekly expenditure on fruit, salads, and potatoes was only 4d. The potatoes were bought as chips and there was very little of them. Doubtless it was at this point that the "living alone" factor just tipped the scales; a larger amount of potatoes boiled at home would have saved the situation. The man was taken into St. Bartholomew's Hospital where a diagnosis of undoubted scurvy was made, and, in the course of his treatment, his misfortune was turned to good scientific account, the urinary excretion of ascorbic acid, before and after treatment, being studied by means of titration. The excretion before treatment was low (6-18 mg. daily), and addition of a daily dose of 187 mg. of ascorbic acid

as orange juice led to little rise in it during the next 10 days. In other words the patient's tissues were not yet "saturated." After 17 days the dose was increased to 281 mg. and the result was an immediate rise in excretion to 42 mg.; by the 21st it had exceeded 100 mg. Study of a second case confirmed these results and a comparison was also made with the values given by a healthy man eating plenty of fruit. The daily urinary excretion in the latter case was 40-50 mg., and administration of 400 mg. of ascorbic acid daily for 10 days produced an immediate rise in excretion to 262 mg. on the first day and to over 400 mg. on the second day—an excretion of over 90 per cent. In agreement with the results of this work is a study from the Vanderbilt University medical school in America.¹ Here the subjects of investigation were not suffering from scurvy, but were consuming diets of very varying vitamin-C content. Some showed urinary excretion of under 10 mg. daily and a number of under 20, while very few rose above 30. The percentage retention after a single large dose of about 600 mg. of ascorbic acid tended to vary inversely with the size of the previously observed urinary excretion, the majority retaining 80 to 90 per cent. The only three subjects who retained less than 60 per cent. and who could be regarded as "saturated" were the only three showing a previous daily excretion of over 40 mg. The contrast is very conspicuous, as illustrated by both these studies, and it is increasingly clear that knowledge of the daily urinary excretion of ascorbic acid, and of the response to a large test dose of the vitamin, is a valuable diagnostic datum in latent or overt scurvy.

MODERN VIEWS ON EVOLUTION

THERE are many grades of opinion among biologists on the question of the mechanism of evolution, ranging from that of the neo-Lamarckians whose faith in the inheritance of acquired characters remains unshaken in spite of the paucity of evidence in its favour, to that of the gene mutationists whose theory has been erected upon an imposing mass of experimental evidence from genetics and cytology. Prof. Walker attempts,² in a recent publication, to reconcile conflicting points of view and facts which have hitherto been difficult to fit into a single theory. After disposing of the Lamarckian theories he ranges himself on the side of the selectionists, but denies the wide application of the chromosome theory of heredity. The most important characters of organisms, he says, are not inherited alternatively and are therefore not borne on the chromosomes, which are responsible for the transmission of relatively insignificant features. The major characteristics must be represented in some other part of the cell. The original suggestion is made that changes may originate in the chromosomes and later be impressed upon the rest of the cell. "Mendelian" characters are thus the recently acquired ones, while older and more basic characters are those which show "blending inheritance." Prof. Walker is justifiably sceptical of the Mendelian explanation of blending inheritance by the postulation of a large number of factors, a procedure which could explain almost anything. He is not, however, always just to the opposing view, and has ignored recent work which tends to show that many "Mendelian" characters are only outward signs of more important physio-

³ Shute, E.: Jour. Obst. and Gyn. Brit. Emp., February, 1936, p. 74.

⁴ Watson, E. M.: Canad. Med. Assoc. Jour., February, 1936, p. 134.

⁵ Saphir, W.: Endocrinol., 1936, xx., 107.

⁶ Rowlands, I. W., and Singer, E.: Jour. of Physiol., 1936, lxxvi., 323.

¹ Youmans, J. B., Corlette, M. B., Akeroyd, J. H., and Frank, H.: Amer. Jour. Med. Sci., March, 1936, p. 319.

² Evolution and Heredity. By Charles Edward Walker, D.Sc., M.R.C.S., Associate Professor of Cytology in the University of Liverpool. London: A. and C. Black Ltd. 1936. Pp. 222. 6s.

logical characteristics, that the action of a gene is by no means fixed but depends upon the nature of the rest of the "gene complex," and that the chromosome theory of sex determination can be reconciled (at least theoretically) with the occurrence of the sex reversal. Many of the difficulties in accepting the complete chromosome theory, particularly those derived from a study of the protozoa, are well stated in this monograph, which is, however, too discursive for easy reading.

Dr. Hurst makes a contribution of a different kind. His book³ is written in a lucid style and is so well planned that no one can fail to follow the arguments. The gene and mutation theories are clearly presented with no mention of any facts which might lead to confusion or to doubt that the theories as at present conceived may apply to all aspects of heredity and evolution. The origin of life in "progenes" is discussed in a manner which almost gives the impression that the matter has already been proved whatever may be meant by the term "progene." That naturally occurring short-wave radiations give rise to mutations which are the basis of evolutionary change is suggested and later assumed in spite of much contrary evidence. This is a readable and entertaining book, but which might, however, mislead the ordinary reader by giving an impression that the basis of the mechanism of evolution is thoroughly understood, and that it is now only a matter of working out the details. Few biologists would claim such finality for the theories of to-day.

THE PERCENTAGE OF OXYGEN IN OXYGEN TENTS

IN order to raise the oxygen-content of the atmosphere of an oxygen tent it is customary to begin by turning on the by-pass so as to obtain a brisk flow from the cylinder. When the required percentage has been reached the stream is adjusted so that it covers the relatively small amount used by the patient, and also the loss by leakage—which varies according to the airtightness of the tent. In many oxygen tents it is intended that the leak shall be sufficient to give egress to the carbon dioxide produced by the patient, making the use of soda-lime unnecessary. It is not practicable to blow away all the carbon dioxide in this way, for the loss of oxygen would be excessive; but an accumulation up to 2 per cent. or more is often considered permissible. On the other hand, in the type of tent where soda-lime is used the absorption of carbon dioxide is so efficient, and the tent can be made so airtight, that the oxygen flow can be cut down to 3 or 2 or even 1½ litres per minute. Recently A. L. Barach⁴ has pointed to a possible disadvantage in the more open type of tent. He was called to see a child 9 years old in one of these tents suffering from bronchopneumonia. The child was as "blue as a serge coat"; the pulse-rate was 160 and the temperature 108° F. The oxygen concentration in the tent was 28 per cent. (the oxygen in the atmosphere being 21 per cent.). Using a second cylinder Barach increased the oxygen flow by 32 litres a minute until the percentage rose to 60. The child's colour immediately began to improve, the pulse-rate came down to 120, and the temperature gradually fell to 101°. The child, whose eyes had previously rolled upwards,

became conscious, and the breathing which had appeared terminal and very shallow took on a deeper and more vigorous character. In another hospital disappointment with oxygen therapy could be traced to the practice of giving 7 litres of oxygen a minute in a tent that "leaked like a sieve." In three other instances in New York Barach found that a flow of 30 to 40 litres was required to keep the concentration between 50 and 60 per cent. Somewhat similar observations in this country were described by Dr. E. P. Poulton in last week's *British Medical Journal*. In a tent of the more open type he found that the maximum value was 35 per cent., and sometimes a value as low as 25 per cent. was obtained.

The problem remains whether the advantage of doing away with soda-lime is counterbalanced by the extra consumption of oxygen necessary or whether the certainty of being able to reach an adequate percentage of oxygen with quite a small flow is worth the expense of the soda-lime used. Barach inclines towards a large flow of oxygen (6 to 8 litres) and an increased leak, while Poulton has emphasised the value of an airtight tent with a small flow of oxygen and the addition of soda-lime. But both concur in the importance of analysing the atmosphere of the tent; and the practice of certain manufacturers in saying that it is unnecessary to test the oxygen concentration if a certain flow (between 12 and 7 litres) is run in, is to be condemned.

TRIGEMINAL TIC

Dr. Wilfred Harris's experience¹ of the treatment of trigeminal neuralgia by alcoholic injection must be unique. He has notes of 1140 cases which he has treated in this way and has recently examined this material for the purpose of summarising some of the lessons to be learnt from it. He suggests that, in order to avoid confusion with other forms of facial neuralgia, the terms trigeminal tic and glossopharyngeal tic should be used for the paroxysmal form of neuralgia which affects these nerves. Analysis of the cases brings out the greater liability of the female sex to trigeminal tic, which Dr. Harris believes to be due to an irritative process at the periphery of the nerve concerned. Of the total number of cases, 748 occurred in women and 392 in men. In 61 per cent. the right side of the face was involved and in 39 per cent. the left side. Of the 60 bilateral cases (over 5 per cent. of the total) 80 per cent. were in women. The author's technique for the injection of the Gasserian ganglion is described in detail, and the importance of proceeding step by step, patiently waiting for the manifestation of the signs appropriate to each stage of the operation before going on to the next stage, is emphasised. Those who have watched Dr. Harris at work will remember that he prefers local anaesthesia in cases where the intelligent coöperation of the patient can be anticipated. Any motor paralysis which results from the injection generally passes off gradually after a period of three months, and even in bilateral cases there is little loss of the power of mastication. Dr. Harris's method of injecting the inner two-thirds of the ganglion where it is unnecessary to destroy sensation over the distribution of the third division of the nerve is well worth noting; it must require considerable practice before any operator can expect to achieve the same measure of success with this delicate manoeuvre as its originator can claim. Since 1926, when Dr. Harris drew attention to the occurrence of trigeminal tic as a complication

³ Heredity and the Ascent of Man. By C. C. Hurst, Ph.D., Sc.D., sometime Fellow Commoner and Research Student of Trinity College, Cambridge. London: Cambridge University Press, 1935. Pp. 138. 3s. 6d.

⁴ Jour. Amer. Med. Assoc., Feb. 29th, 1936, p. 725.

¹ Ann. of Surg., 1936, civl., 161.

of disseminated sclerosis, he has several times observed the occurrence of trigeminal tic and disseminated sclerosis in members of the same family. In some families there had been a familial tendency to trigeminal tic; in one no less than nine members in three generations suffered from the disease.

PROLONGED ANALGESIA

THE relief of intractable pain is always a major medical problem, and when the pain is chronic it is one that tests the resources of the practitioner to the utmost. Sometimes, of course, the pain depends on a local cause which is accessible to local remedies; for instance, the pain following many rectal operations is often of this description. Here much can be done by strict cleanliness at the actual operation to diminish the suffering which used to be regarded as an inevitable sequel to any operation on the rectum. Nevertheless, operations in this region are more often than not followed by pain, more or less severe, even to-day. Frequently opiates are employed to control it, but since the symptom is of purely local origin it ought if possible to be controlled by local measures. Some rectal operations are satisfactorily performed under local anaesthetics, but the analgesic action of these is usually brief, and they cannot readily be applied again to the wound. A local analgesic with prolonged action would therefore be a great gain, but it is no easy task to find one which is both effective and innocuous. Quinine and urea chloride, for example, though excellent for its lasting effect, is liable to produce sloughing. N. J. Kilburne¹ describes the investigation, experimental as well as clinical, of a number of analgesics, with the object of finding one which could be used locally and could produce long-lasting effects. This he claims to have found in Eucupin, a modification of quinine hydrochloride with urethane. This is also bactericidal, and is said both to relieve pain and keep down infection. It is applied by soaking cotton in a 0.75 per cent. solution and pressing it into the wound. Kilburne's experiments with oily substances have not led him to regard these with favour for prolonged action, but we believe that trials now in progress at a London hospital are giving more encouraging results.

THE GOAL OF EUGENICS

AN attempt to portray in simple but accurate language the main principles of eugenics and their application to social problems has been made by Mr. Huntington in conjunction with the directors of the American Eugenics Society.² It is an outgrowth of an original report of a committee of the American Eugenics Society, prepared under the direction of Prof. Irving Fisher, and it is intended for intelligent people who make no claim to scientific knowledge concerning eugenics. In a preface the author informs us that he has done his best to express the general sentiment of the group of directors as a whole, but modestly adds that he has doubtless given too much weight to his own views. It is questionable whether the book will be found of much service to medical readers. It is prepared in the form of a catechism containing 371 questions and answers. Many of these are worded in such a way as to apply primarily to American conditions. Much the most difficult task which to-day confronts writers on eugenics is to give a satisfactory account of the aims and methods of "positive" eugenics; of how, in other words,

to encourage the fertility of persons regarded as biologically well-endowed. The fact having been noted that rural communities have a higher fertility than urban, American eugenists advocate a back-to-the-land movement which they hope may be organised on a sufficient scale to affect the country's birth-rate. Such proposals are hardly applicable to this country. Like most eugenists, Mr. Huntington is concerned lest schemes for promoting fertility should act dysgenically by encouraging the reproduction of biologically inferior strains at the expense of biologically superior. In this connexion the reader will frequently encounter throughout the book phrases such as a "well-matured plan of eugenic selection" or "an adequate basis of selection" which will enable us to distinguish eugenically superior from inferior stocks. A 372nd question which many medical readers would like to ask the author is whether anyone has yet devised a workable and scientifically valid scheme of eugenic selection applicable to the average citizen; and if not, why the American Eugenics Society does not try to do so. Most people admit that a small proportion of grossly unfit persons can be distinguished, of whom it can be definitely said that they should not become parents. But in view of the limitless variety of physical, moral, and mental qualities which combine to constitute good and bad citizenship, it is far from obvious how we are to recognise the person who embodies these various qualities in such a way as to enable us to regard him as representing a eugenically average type. If an average type cannot be recognised, how are we to devise well-matured plans, and establish adequate bases, of eugenic selection designed to encourage the fertility of persons above that average and to discourage that of persons below it?

ARTHUR SHADWELL

THE death of Dr. Arthur Shadwell which occurred on Saturday last at a nursing-home at Richmond has removed from among us a distinguished authority on many social questions and an effective writer on social matters of the first importance. The son of a Yorkshire clergyman, he was educated at Uppingham where he acquired under Paul David a knowledge of and taste for music which never left him. He went to Oxford as an exhibitor at Keble, was a student at St. Bartholomew's Hospital, and having graduated in medicine practised for a time in Brighton, where he became assistant physician to the Sussex County Hospital. He proceeded to the Oxford M.D. and was elected F.R.C.P., but he soon retired from the active practice of his profession to use his academic and practical training to fine advantage in dealing with such great subjects as the temperance question, epidemiology, urban water-supplies—especially the London water-supply—the arguments for and against socialism, and the application of economics to political activities. As a special correspondent of the *Times* he made investigations into epidemics of cholera in Germany and Russia, and in 1909 he published under the title of *Industrial Efficiency* a large volume in which he recorded the results of his personal study of economic conditions in this country, on the Continent, and in the United States, a work which gained him the degree of LL.D. Birmingham. Ten years ago he wrote an excellent handbook entitled the *Socialist Movement*, in which he was able to display his first-hand familiarity with much of what he discussed, his singularly fair attitude of mind, and his wide acquaintance with social history. The FitzPatrick lectures delivered before the Royal College of

¹ Surg., Gyn., and Obst., March, 1936, p. 590.

² *To-morrow's Children: The Goal of Eugenics*. By Ellsworth Huntington. New York: John Wiley and Sons, Inc.; London: Chapman and Hall Ltd. 1936. Pp. 139. 6s.

Physicians of London in 1925 and 1926 proved his classical learning. He was opposed to the State management of industry as advanced by the advocates of socialism, but he was able to give the authority for his arguments, either derived from his own work or that of others, and his appeals for reforms gained added force from his reasonableness. Through his long and distinguished connexion with the *Times* and the historic and literary value of his books, Shadwell became an authority in many provinces of political economy. If he wrote more as a philosopher than a doctor his medical training was always at the back of his arguments.

THE POSITION OF CHIROPODY

THE prosperity of the Incorporated Society of Chiropractors was emphasised at the recent annual dinner of the society noticed in another column; and from the mouths of the speakers it could be gathered how wise the attitude of the medical profession had been in regarding the therapeutics of the foot as a definite branch of ancillary medicine which ought to be in the hands of an organised body of workers. When the movement for the recognition of chiropractic in this manner first took shape many members of the medical profession viewed it with but qualified approval. But with the spread of scientific knowledge a too exclusive attitude has long been found illogical. As medicine in the development of its own work has had to call for aid from other sciences, the necessity for proper co-operation in medical work with workers outside the professional roll became clear and the increasing importance attributed in the medical curriculum to the preliminary subjects may be mentioned in obvious proof. But the spirit thus shown in the scheme of general medical education has not stopped there but has extended to various fields of practice, and the Society of Chiropractors forms a good example of this. When the movement for professional collaboration with the society originated there were found in opposition those who held that the absence of full medical training made professional union a dangerous course, but those who desired to see professional co-operation occur were able to counter by saying that as a matter of fact the fully qualified medical man had not, save in the instance of a few specialists, cultivated that field of therapeutics. The treatment of the foot, apart from definite surgical treatment, had been left to the charge of chiropractors and the advocates of proper collaboration held that it was a duty of the medical profession to assist the chiropractors to become an organised and standardised body, with whom regular medical consultation could take place. The liberal view was taken with the approval of the Royal Colleges and the British Medical Association, and the effect has been successful. The society, in association with its Foot Hospital, is doing valuable work and extending its activities throughout the country.

A PANORAMA OF CURRENT THERAPEUTICS

THIS week the first 35 articles of the series on treatment in general practice now running in the *British Medical Journal* have been issued together in the form of an attractive book.¹ The contributions include those on diseases of the respiratory tract (14), acute specific fevers (6), and cardiovascular diseases (15); the other group of articles published in 1935—referring to the nervous system—and those on the

treatment of digestive disorders appearing this year week by week, with their successors, will be collected in subsequent volumes. The whole will form, as the editor of the *British Medical Journal* says in his preface, a panorama of current therapeutics, a composite picture of the art and science of medicine to-day none the less valuable because parts of it will need touching up and perhaps even repainting to-morrow. All the contributors are teachers of clinical medicine in various schools, and the practical simplicity of the methods of treatment outlined refutes once again the calumny that the outlook of the modern specialist is too academic or his armamentarium too dependent on diagnostic aids to make his advice of much use outside the great cities. At the same time some of the credit for the practical, even occasionally dogmatic, nature of the teaching is due to editorial vigilance. The volume is slender enough to be pleasant to handle and the type is easy to read.

WE regret to learn the sudden death at Farncombe on Sunday last of Sir James Smith Whitaker, late senior medical officer to the Ministry of Health.

Dr. A. Rupert Hallam, lecturer on dermatology in the University of Sheffield, has been appointed by the National Radium Trust to be a member of the Radium Commission, in succession to Sir Arthur Hall.

THE Lister memorial lecture will be delivered by Sir Robert Muir, F.R.S., at the Royal College of Surgeons of England on Tuesday, April 7th, at 5 o'clock. He will speak on malignancy with illustrations from the pathology of the mammal.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Capt. E. MacEwan to *Barham* (on transfer of flag).
Surg. Lt.-Comdr. J. H. Nicolson to *Woolwich*.
Surg. Lt.-Comdr. (D.) L. R. Armstrong to *Pembroke* for R.N.B.
Surg. Lts. J. G. Slimon to *Challenger*; A. H. O'Malley to *Victory* for R.N.B.; and C. J. Mullen to *Pembroke* for R.N.B.
Surg. Lt. (D.) R. S. Jenkins to *Woolwich*.
The following have received appointments as Surg. Lts. for short service: B. M. Goldsworthy, St. Thomas's Hospital; T. J. Harkin, Royal College of Surgeons in Ireland; M. G. H. Heugh, London Hospital; L. Merrill, Guy's Hospital; E. H. Murchison, Glasgow University; and G. A. Maxwell Smith, Edinburgh University.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt. S. C. Suggitt to *Pembroke* for R.N.B.

ROYAL ARMY MEDICAL CORPS

Lt.-Cols. E. G. R. Lithgow and P. C. Field retire on ret. pay.
Majs. L. M. Routh and F. D. Annesley, M.C., to be Lt.-Cols.

TERRITORIAL ARMY

Supernumerary for service with O.T.C.—Lt. N. J. Logie (empld. Aberdeen Univ. Contgt. (Med. Unit), Sen. Div., O.T.C.) to be Capt.

ROYAL AIR FORCE

Group Capt. F. N. B. Smartt to Headquarters, R.A.F., Iraq, Hinaidi.

Flying Offrs. A. S. Amsden to No. 3 Armament Training Camp, Sutton Bridge, and H. E. Bellringer to No. 1 Armament Training Camp, Catfoss.

Dental Branch.—Flight Lt. W. D. Guyler to R.A.F. Record Office, Ruislip. Flying Offrs. I. St. C. Alderdice, O. F. Brown, J. H. G. Fensom, S. Hill, R. A. Pepper, and W. A. H. Smith to Medical Training Depot, Halton, on appointment to non-permanent commissions.

¹ Treatment in General Practice. Articles from the *British Medical Journal*. London: H. K. Lewis and Co., Ltd. 1936. Pp. 250. 8s. 6d.

PROGNOSIS

A Series of Signed Articles contributed by invitation

XCIV.—PROGNOSIS IN FRACTURES OF THE OS CALCIS

A MAN who fractures his os calcis wants to know first how long it will be before it has recovered, and next, whether there will be any permanent disability. The prognosis in both respects depends primarily on two essential factors: early and accurate diagnosis and efficient treatment. The diagnosis may be obvious, as with a man who lands on his feet from a height and has great pain and broadening of his heel, but in other cases it may be overlooked unless an X ray is taken. Indeed an X ray is essential not only for diagnosis but for determining the exact variety of fracture. An ordinary but true lateral view sufficiently good to show up at least some details of the internal architecture of the bone must be obtained as well as the special oblique posterior-superior view used for os calcis work. It is sometimes only in the latter view that the fracture is recognisable.

The notes and figures on prognosis set out below are based on the patients with fractures of the os calcis treated by the surgical staff at

Type.	Cases.	Weeks of disability	Functional result.
1. Small fracture at anterior end of os calcis.	6	13	G.
2. Fracture of internal tuberosity.	4	10	G.
3. Fracture of upper part of posterior surface (traction type).	5	22	4 G., 1 F.
4. Fracture through the body of the bone, which does not involve the subastragaloid joint.	4	27	G.
5. Fracture involving the subastragaloid joint but with little or no displacement.	13	32	6 G., 6 F., 1 B.
6. Fracture involving the subastragaloid joint with definite displacement.	50	54	21 G., 18 F., 11 B.

G. = good; F. = fair; B. = bad.

St. Bartholomew's Hospital in the last ten years. The records of 82 fractures of this bone occurring in 72 patients have been examined. The fracture was bilateral in 9 patients, one of whom had 3 fractures, the left os calcis being refractured some years later. All were males except 8; the average age was 42. In nearly all cases the injury was caused by the patient falling on his feet from a height, sometimes not great. Most fractures of the os calcis are due to compression of the bone as the patient lands on his heels, but the traction type (vide infra) occurs from the sudden pull of the tendo Achillis as the patient lands on his toes.

It is probably well known that prognosis in fractures of the os calcis is bad; in fact for period of disablement and percentage of subsequent disability it ranks amongst the worst in the body. Although the os calcis is a small bone a number of different types of fracture are recognised, so many, in fact, as to make the nomenclature quite confusing. For the purpose of this article the use of as few subdivisions as possible was contemplated, but six has been found to be the minimal number which suffices (see Table).

As these cases were spread over a period of about ten years several methods of treatment were employed. In many of the earlier cases either no splintage was used or else a wooden back splint for two or three weeks was followed by massage and movements. In later cases the foot was fixed in plaster for from

4 to 6 weeks; and still later for 10 or 12 weeks. More recently in cases where there has been deformity of the bone and the subastragaloid joint has been involved an effort has been made to correct the displacement mechanically by pulling the

posterior part of the bone downwards and backwards by a calliper fixed in the posterior part of the bone and attached to the well-known Böhler's traction apparatus; at the same time the bone has been compressed by a clamp, and the foot then immobilised in plaster. In four cases a subastragaloid arthrodesis had been performed.

As has been indicated above, the patient is concerned with the chances of permanent deformity of the foot and with the economic results likely to ensue. The latter are of the utmost importance to the working man. To estimate the economic results of these fractures we must look not to X rays to see whether perfect anatomical alignment of the fragments has been obtained but to the patient himself to find out whether he has pain or disability, when he was able to return to his previous work, and whether indeed he has not been permanently disabled. Of the 82 cases in this series the present

condition of 52 has been ascertained. The results have been analysed to reveal: (1) the length of time before work could be recommenced; (2) the functional result as regards the foot, which is arbitrarily divided into good (G.), fair (F.), and bad (B.). In the

Table, the average period of disability before work could be recommenced is given in weeks for each type of fracture, followed by a note of the functional result. These results clearly show how closely the prognosis is linked up with the involvement of the subastragaloid joint. Where the joint was not involved good results were obtained, but of the patients in groups 5 and 6, less than half had good functional results and where there was also displacement of fragments a fifth had really bad

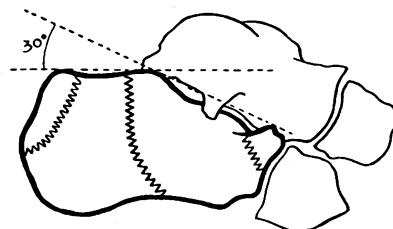


FIG. 1.—Types 1, 3, and 4 of fractures of the os calcis are here indicated. The normal "tuberosity-joint angle" formed between two lines, one from the highest point to the anterior angle and the other from the highest point to the upper part of the tuberosity (Böhler), is shown.

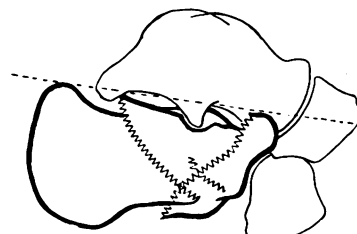


FIG. 2.—Type 6, fracture of os calcis showing compression with flattening as indicated by complete loss of "tuberosity-joint angle" so that all three points are in a straight line (cf. Fig. 1). The heel is very short.

results, some being unable to do any work, others being capable only of light work and all having persistent pain. An arthritis in the subastragaloid joint seems to be the cause of the pain; the patient describes it as being on either side of the heel and indicates points where the pain is worst an inch below the malleoli on each side. In the first few weeks after a fall on the heel a patient may complain of severe pain under the heel when he bears any weight on it, but this is relatively transient and the persistent pain is at the sides, more particularly the outer side.

The prognosis thus depends to a great extent on the type of fracture, but there are several other factors which must be taken into consideration. Amongst these are the method of treatment undertaken, the age and weight of the patient, whether he has a tendency to "rheumatism," and last but by no means least his mental outlook. The last is a major consideration in determining recovery after any fracture, and in those, like that of the os calcis cases, which involve a long convalescence it is a most important factor. The patient who has no question of compensation to brood over, has his own business to return to (and the sooner the better for him), who expects and is prepared to put up with some pain and inconvenience, and above all has an optimistic temperament, will recover far quicker than one without such advantages. Often one can judge from the light-hearted and stoical bearing of a patient when first seen that he will return to work as soon as he is allowed, while another in similar plight may drag on gloomily with pain for weeks, perhaps suffering not only from severe pain but also from "compensitis."

Recovery from any fracture is usually slower in the aged than the young, but age is a less important factor in os calcis fractures than is weight. It is hardly to be wondered at, if we consider the position of the os calcis, that the thin short subject makes a quicker recovery than does the heavy one.

Persons prone to "rheumatism" are more likely to get stiffness, pain, and arthritic changes following any injury than are others.

As to the effect of treatment in our series the final result bears no constant relation to the method of treatment employed. Some patients who had but three or four weeks on a back splint had better functional results and less pain than those immobilised for as many weeks in plaster, though mostly the advantage seems to be in the other direction. So many methods are advised for os calcis fractures that it is clear that none is entirely satisfactory; but the one point in treatment that *does* appear to influence the result favourably is a reconstruction of the shape of an os calcis which has been crushed. There are several methods of traction and compression in use for this purpose. But it remains true that two patients with similar fractures and similar treatment may end up with very different functional results.

A prognosis which may seem hopeless, when the os calcis is badly comminuted and deformed and the patient continues to have pain and disability, may be improved if an arthrodesis to fix the joint between the os calcis and astragalus, and perhaps cuboid as well, is performed. Two minor points deserve consideration. In some fractures of the os calcis the bone is not only compressed but is considerably shortened in its antero-posterior length. This diminishes the leverage on which the tendo Achillis works and so gives a certain feeling of weakness to the patient, but should not prevent him from doing his work. In certain very severe cases, where the os calcis is not only greatly comminuted and compressed but the

surrounding bones are also injured, the functional result may be excellent; what really happens is that the os calcis and astragalus unite by bony union, and instead of a painful arthritis the patient has a painless solid joint. It is true that the foot may not be a very good shape, but this is a small price for a working man to pay for freedom from pain.

In conclusion it must be realised when the subastragaloid joint is involved by the fracture there will be little movement in this joint, although the patient may have a good result so far as freedom from pain and ability to work are concerned. The movements of flexion and extension at the ankle-joint are of course unaffected, but inversion and eversion of the foot are very limited and the patient finds difficulty in walking over rough ground or on the side of a hill.

SUMMARY

The prognosis of fractures of the os calcis is considered after a study of the results in a series of 82 cases. The results depend largely on whether the subastragaloid joint is involved. Prognosis also depends to some extent on the age, weight, and mental outlook of the patient and on the method of treatment employed. Those patients with fractures of the os calcis which do not involve the subastragaloid joint may expect to have a foot free from pain and to be able to return to work in three to six months. In those in whom the joint is involved the period of disability is likely to be on an average one year or longer; many of these will have permanent pain and few may expect a good result.

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INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED
MARCH 14TH, 1936

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2344; diphtheria, 1153; enteric fever, 13; acute pneumonia (primary or influenzal), 1383; puerperal fever, 37; puerperal pyrexia, 117; cerebrospinal fever, 24; acute poliomyelitis, 5; encephalitis lethargica, 6; dysentery, 39; ophthalmia neonatorum, 101. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on March 20th was 5982, which included: Scarlet fever, 664; diphtheria, 1050; measles, 2798; whooping-cough, 712; puerperal fever, 21 mothers (plus 13 babies); encephalitis lethargica, 283; poliomyelitis, 5. At St. Margaret's Hospital there were 21 babies (plus 13 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox, 2 (1) from enteric fever, 106 (39) from measles, 5 (1) from scarlet fever, 33 (5) from whooping-cough, 30 (5) from diphtheria, 57 (17) from diarrhoea and enteritis under two years, and 84 (9) from influenza. The figures in parentheses are those for London itself.

The mortality from measles is still rising, the figures for the last six weeks (working backwards) being 105, 84, 88, 78, 58, 34 for the country as a whole, and 58, 47, 38, 18, 14, 13 for Greater London. Leeds reported 7 deaths, Manchester, Salford, and Shetfield each 4, Liverpool, Wallasey, West Hartlepool each 3, no other great town more than 2. Deaths from influenza are on the wane; this week they are scattered over 46 great towns, Manchester and Birmingham each reporting 5, Shetfield and Leicester each 4, Birmingham reported 5 deaths from whooping-cough. Deaths from diphtheria were reported from 21 great towns, 3 from Manchester. West Hartlepool reported a death from enteric fever.

The number of stillbirths notified during the week was 206 (corresponding to a rate of 39 per 1000 total births), including 37 in London.

SPECIAL ARTICLES

COMPENSATION AND THE RETURN TO WORK

BY JOHN P. STEEL, M.D. Edin.

MEDICAL SUPERINTENDENT, SMITHDOWN ROAD HOSPITAL,
LIVERPOOL

WHEN compensation cases are referred for a definite opinion on the fitness of workmen for resumption of duty, a certain difficulty frequently arises in giving a report. Such cases divide themselves into three categories :

- (a) Those who are fit and those unfit for work.
- (b) Those where there is doubt about the extent of the result of the injury.
- (c) Those suspected of endeavouring to obtain the greatest benefit for themselves as a result of the accident, irrespective of capacity for work.

With those classified under (a) there is no difficulty, and an honest certificate can immediately be given, but those under (b) cannot readily be divided from the cases which are considered in the dubious category of (c). It is not fair to the patient to make a sharp dividing line between the doubtful case and the case considered to be the equivalent of a malingerer, without a very close investigation, not only of the sociological and physical state, but also of the mental attitude of the patient.

When industry is at its height and there is little unemployment, these compensation cases are fairly simple, for the employer is only too pleased to have back a trusted man who is able to do some work for him, and he is willing and able to put profitable work (profitable to both the employer and the employee) into the way of a man who has had, and is returning from, an accident. But when the labour market is overstocked the large employer is able to call on any number of men to do the full work of the injured man at the same rate of wage. The economic factor governing a large business tells the employer to take on a man who can do a full day's work for a full day's pay, and he has to be content, therefore, to have the work done and to pay (or have paid by his insurance company) the man injured in his service at the reasonable rate of compensation laid down by the exigencies of the circumstances. In other words, when the labour market is glutted no employer (or at any rate very few) is able to offer what is commonly known as light work. This lack of "light work" is prone to weigh hardly on the honest employee who has suffered an accident, and has been paid compensation, on behalf of his employer. Let me quote two cases :

(1) A man working at the docks, who had a good reputation with his employers and with his fellow workmen as a man who did all he could for his wages, received a crack fracture of his right tibia when a sack fell from a crane at the side of a ship he was loading. The fracture was treated in the routine way and he had a considerable period off duty, receiving the full amount of compensation he was entitled to. When this had to be reviewed, he was referred for special examination and no gross damage was found.

(2) A man, whose duty it was to climb a ladder of 30 to 50 feet, one day fell, through no fault of his own, and received a somewhat severe jarring, with but little show for his accident. He, in turn, having been injured at work, received the full amount of compensation.

Both of these cases were referred for examination, and in each the same difficulty arose. Whilst no

crippling pathological condition could be found, yet there was a definite feeling that the patient was not able to take up his ordinary avocation. If a certificate had to be given on the present state of the workman, it would have had to be honestly stated that there was no apparent or ascertainable physical disablement, but, nevertheless, it was quite obvious that neither man was able to leave the hospital and start work—full work that is to say—the following morning. Both were more than anxious to get off the compensation period and to earn full wages, for both had dependants relying on them. In neither case, however, did it seem fair to run the risk of putting them at once to the ordinary hazard of their occupation, and a report had to be given saying that they were not fit for their ordinary duties, even though they wished to resume.

One difficulty in these cases is the complete lack of "light work." If a man has had an arm in plaster for seven weeks and has had repeated X rays showing the fracture of a bone and the gradual process of repair, the doctor is not able to take off the plaster and say "that arm is completely healed, there is now no fracture, and work can be started at once." He says "a certain amount of re-education of muscle and nerve is necessary" and recommends the use of the arm and the hand in increasing amount until normality is reached—in other words, a period of re-education. In more prosperous times such a workman who has been under compensation could be referred to light work which acted as re-education, but when the labour market is overstocked this is well-nigh impossible. The referee must then make up his mind whether those in category (b) and (c) are, in the industrial sense, completely recovered or only partially recovered. For the major injury he has to take into account not only the physical disability which has been recovered from, but the psychological trauma. It is not reasonable to expect a man who is a window cleaner by trade to go from hospital (when all his abrasions and bruises are healed and he has had a few days convalescence) back to the work which caused his disability. There is bound to be some psychological shock, and the fear (say) of a repetition of his fall is liable to make his work such that he may fall again.

In cases coming under category (c) the referee cannot say at once, or even after considerable thought, that a man is "swinging the lead," for of all dangerous diagnoses malingering is the one which takes the most substantiating. Where there is any possible doubt—and the case of the workman must be considered as of primary importance for his labour is all he has to sell—a full assessment of physical state, mental ability, and mental retardation or apprehension due to the accident must be made. In these circumstances it does not seem reasonable to ask a physician or a surgeon to give a final report on the desirability of terminating compensation on his own single responsibility.

Where there is the slightest doubt in my mind as to the desirability of re-education I have always endeavoured to have the man retained on compensation for a sufficient length of time for his reference to, and consideration by, a psychiatrist. I feel no loss of dignity in adopting this procedure, for not only is my opinion checked by a man who is a physician, but it is also considered by a practitioner who is able, and has the time, to assess the mental state and outlook of the injured man. I think that, before

the borderline case is put back to hard manual work at which he has suffered an accident and at which he has received psychological trauma, the opinion of an expert in psychological medicine should be obtained. In this way not only will justice be done to the injured man, but an additional safeguard will be offered to the employer against malingering.

The opinion of the physician or surgeon, reinforced by that of the psychiatrist, will carry weight in any court of law. If "light work" is not available it would pay the large insurance companies to have a re-education centre for such cases, for in the good type of workman this re-education is essential before the full day's work can be done for the full day's pay.

THE MATERNITY SERVICES

A Manifesto by the British Medical Association

UNDER the title *An Urgent National Problem* the British Medical Association has issued a reply to recent public statements about maternal mortality in Great Britain. "Maternal mortality," the Association has declared, "is a scientific and administrative problem which deserves careful and scientific study, but, in the experience of practising doctors the publicity which it is receiving to-day is tending to terrify child-bearing women and is, in itself, a cause of increased mortality." In the statement now issued the Association emphasises the fact that maternity is a natural physiological event, though it is one involving complex delicate and important processes. Departures from the normal occur in a small proportion of cases. The vast majority of cases are conducted with complete success in every respect, and, as demonstrated by comparable statistics, there is only one country in the world (Holland) in which safety appears to be *slightly* greater than in this country. In nearly every other country maternal mortality is considerably higher than it is here.

Maternity and its conduct are not concerned merely with attendance during the actual process of delivery but comprise supervision from the time that changes consequent upon conception manifest themselves until the return to normal some short time after childbirth. This whole period cannot be isolated from the rest of the health history and experience of the mother whether before, during, or after the period of actual pregnancy and parturition; it is an integral part of such medical help, advice, and treatment as the mother is accustomed to receive apart from maternity. All available evidence demonstrates that normal confinements, and those which show only minor departures from the normal, can be more safely conducted at home than in hospital.

During recent years a number of authorities have established a type of antenatal clinic in charge of whole-time medical officers; they have provided an increasing number of hospital beds for maternity cases without careful selection of admissions on medical grounds, thus cutting off the local medical practitioners from a considerable part of their maternity experience. This action has been accompanied by an appreciable increase in maternal mortality thereof. The Association points out that where a large number of maternity cases are aggregated in hospitals there is commonly an increased risk of puerperal infection; very disappointingly antenatal clinics, on their present lines, have not been and seem unlikely to be successful. These considerations

are of the first importance when local authorities are considering communal action.

The medical requirements of a woman during the period of maternity are these:

1. Medical supervision *throughout* by the doctor of her choice, with specialist and hospital aids where needed.
2. Efficient nursing and advice by a skilled midwife or maternity nurse of her choice.
3. Provision of help in the house during the period of her actual incapacity.
4. Supply of dressings, special apparatus, or means of transport when required.

There are, of course, large numbers of women who can provide one or more or all of these requirements for themselves, but the Association is strongly of opinion that the State should see to it that, by some means or other, whether by an extension of the scheme of national health insurance or by the action of local health authorities, they should all be available for every mother. There would still remain urgent need for further action to persuade women to take advantage of the means provided for them, for research into the obscure causes of puerperal sepsis and other forms of maternal morbidity, and for the improvement of knowledge, skill, and care among those who have any part to play in the responsibility for the conduct of maternity.

The statement concludes: "Fully appreciative as it is of the great need for improving the position of midwives both as to training, status and finance, the Association believes that legislation to these ends is but a small part of that which is required to remedy the imperfections of the present system, and that it is essential to take steps in rapid succession to establish a complete maternity scheme on the lines indicated in this memorandum, envisaging from the outset the needs of mothers as a whole and the methods of providing for them."

Midwives and Their Views

THE long delay in the appearance of the Midwives Bill after the promise of such a Bill had been made by the Minister of Health was due to the need to consult the local authorities which will have to administer its provisions. The interval has not been lost by organised midwives who have utilised it to find out more exactly what is the position of the midwife in independent practice at the present time. This investigation included the issue of a questionnaire to all midwives believed to be in independent practice through England and Wales, and the abundant information thus accumulated was analysed for the Midwives' Institute by Lady Forber (Dr. Janet Lane Claypon) with the help of Dr. Elizabeth Macrory. Lady Forber used a preliminary analysis of this material in the Fynes-Clinton lecture which was summarised in a leading article in our own columns (1935, ii., 1009). On the eve of publication of the Midwives Bill a considered report of this investigation has now been issued by the Institute in convenient pamphlet form.¹

THE MIDWIFE AS SHE IS

The report is described by Miss E. M. Pye, president of the Institute, as a social document of importance; she emphasises the fact that here is a true picture of the midwife's life as she now lives it. Part I. gives the nearest estimate we have of the number of midwives in practice. Part II. sets out the causes

¹ *The Midwife in Independent Practice To-day*, pp. 32, 6d. (special prices for large quantities), from the Midwives' Institute, 57, Lower Belgrave-street, London, S.W.1.

which have adversely affected this practice. Here it is shown how deeply the increasing hospitalisation of parturient women ("which appears not yet to have reached its maximum") has cut into the midwife's work. The greatest factor in the demand to be delivered in hospital is here found to be the campaign of publicity by which it was expected that maternal mortality would be reduced. The belief has grown up among women that they are less liable in hospital than at home to succumb to the death which they are told may await them as a result of child-bearing; this, it is suggested, carries with it a desire to have a doctor in case anything should go wrong and also probably to avoid pain by having an anaesthetic. Other factors of course are the saving of trouble and often of cost by confinement in hospital and the small space available for the purpose in modern flats. The fees charged by hospitals in many parts are so low that it is cheaper for the mother to go there than to stay at home for her confinement, although the actual cost in hospital must be much higher. In this section of the report the question naturally arises, What is the maternal death-rate in the practice of midwives? When in the past it has been shown that this death-rate is low, the statement has often been countered with the remark that the figures did not include the deaths of women sent in from the midwife's practice to hospital. In the present investigation the cases sent into hospital are included and material is available for releasing the independent midwife from any blame for the alleged high maternal mortality. In this section also is a note on "undercutting and overlapping" in which the great increase of midwives starting practice is attributed to the large number of unnecessary midwives who are being trained. Here it is stated that in a large number of areas the handy-woman is still sufficiently prevalent to be a source of trouble. If the midwife, and the midwife only, was required to notify the birth the presence of a handy-woman conducting the confinement would easily be discovered.

A SALARIED SERVICE

The report also estimates with care the number of midwives who would be needed for the proposed salaried service. Taking 100 births in the year as the number a midwife working whole time may be called upon to attend, it is suggested that just over 2000 midwives would be needed in the large and small towns set out in the Registrar-General's annual summary for 1934. The investigation indicates that the number of practising midwives now over 60 years of age is about 580 and that 1200 others under 60 years of age will not be required. This does not include the rural or smaller urban areas, but in these there are few midwives with large practices, for most of the work is done by nursing associations, the practising midwives only taking relief work for the district nurses. In view of the probability that those displaced will be chiefly the older midwives, the report suggests that a small pension should be the form taken for compensation; women over 50 years of age cannot start a new profession nor as a rule can they take up other work. The scale of pensions and compensation suggested should be studied in comparison with those proposed in the new Bill.

QUESTION OF HIGHER TRAINING

At this opportune time appears also an appeal for the higher training of midwives in a report² by the Council which for 31 years has furthered this object by every possible form of publicity and in so doing

has brought into being the British Hospital for Mothers and Babies at Woolwich from which highly trained midwives have gone out to all parts of this country and the dominions.

"We still greatly hope," the report runs, "that a two years' training may be demanded by Government shortly, for all midwives whether State-registered or not. And as such a course would greatly diminish the numbers of pupils working now in maternity hospitals, we trust that their ranks may be recruited by State-registered nurses receiving a six months' maternity nursing training in contradistinction to midwifery. This course which has been found to answer admirably in Holland has the further inestimable advantage of not interfering with the training of medical students. It is common knowledge that much of the training material, which is so urgently needed for their benefit and that of their future patients, is now absorbed by over 1500 pupil-midwives yearly who have not the faintest intention of using, on behalf of the working mothers or their infants, the experience they have gained."

MIDWIVES AND/OR MATERNITY NURSES

The annual report of the British Hospital, just issued, contains an account of the midwifery service in Holland written by Dr. Eileen Wise, visiting obstetrician, and Miss M. M. Cashmore, sister-matron, who were asked to visit the State training schools for midwives in Amsterdam and Rotterdam. They discovered that trained maternity nurses, as apart from midwives, are an integral part of the Dutch midwifery service and to this fact is due, they think, in great measure the increased maternal safety. In Holland all operative midwifery is referred to well-equipped maternity hospitals, no obstetrician dealing with complicated cases at home. The midwives are State servants with a high status; the competitive entrance examination is only passed by a quarter of the candidates. The theoretical training is directed towards making the midwife capable of thinking. Her clinical training is extensive, simple, and practical, and before its completion she acts as locum tenens for midwives absent from their practices on refresher courses which take place monthly. The larger half of deliveries in Holland are attended by midwives, the remainder by doctors and maternity nurses. The latter are State-registered nurses who, on completion of their general training, have undergone a further six months' training in State maternity hospitals when they are State examined and registered. There is another class of maternity nurse with no general training but with 18 months' training in State maternity schools, and these work among the poor under the district midwives.

ROYAL SUSSEX COUNTY HOSPITAL.—At the annual meeting of the governors on March 11th it was reported that the ordinary income for 1935 fell short of the maintenance expenditure by £8344, and that the deficit had had to be met by drawing upon the limited reserve fund. In spite of the growth of the population of Sussex, and the increased demands made upon the services of the hospital, the income had fallen; and during the year in response to an urgent appeal to provide and maintain at least another 100 beds, less than one-fifth of the money needed had been received. Commenting on the Milk Marketing Board regulations the report states: "It is surely an anomaly that a child in health can be supplied with milk by the education authorities on better terms than hospital authorities can supply milk to that child when sick." The governors regard the increased price of milk as being tantamount to a tax, and it is suggested that the rebate allowed to hospitals on the tax on certain spirits should be regarded as a precedent for granting relief on milk. The milk bill of this large hospital of 272 beds amounted in 1933 (the regulations came into force on Oct. 1st of that year) to £1467. This figure rose to £1588 in 1934 and to £1672 in 1935.

² Woolwich: C. F. Thorn and Son, 60, Wellington-street, S.E.

PANEL AND CONTRACT PRACTICE

Prescriptions for which the Insured Person Must Pay

It sometimes happens that insurance practitioners are asked to issue prescriptions for patients who are receiving treatment at hospitals, possibly under arrangements made by the doctors concerned. Here is a case in point where the doctor received a telephone message from the almoner of a hospital asking him to issue a prescription for three Elastoplast bandages for a patient whose treatment at the hospital had involved the use of that number of bandages, the statement being made that unless the doctor would agree to do this the patient would be charged the value of the bandages. The doctor appealed for advice to the insurance committee and was told that an insurance practitioner is called upon to prescribe for insured persons only during the time when he is actively engaged in treating them; his responsibility to prescribe ceases during the time the patient is in receipt of treatment by a member of a hospital medical staff. This point may not appear to be of much moment when the cost involved is but a few shillings, but a rather different complexion is assumed when an appliance such, for example, as a spinal jacket is needed. This particular appliance may now be prescribed by insurance doctors when required for the treatment of fractures, diseases, or dislocations of the spine, and it seems illogical that an insured person should be at the risk of having to pay several pounds for an appliance ordered by a hospital surgeon which if it had been prescribed by his insurance doctor would have been provided free as part of medical benefit. The remedy would perhaps be for the surgeon, to whom the insurance doctor had referred the case, to inform the latter that the patient in his opinion needed the appliance, and for the insurance doctor in his discretion to order it on an insurance prescription. This procedure would follow very closely what happens when a member of a hospital staff advises a particular line of medical treatment, but would of course apply only to those out-patients who had attended the hospital on the advice of the insurance doctor.

Ophthalmic Certificates

Clause 9 (2) of the Terms of Service provides that if the condition of the patient is such as to require any ophthalmic treatment which is not within the scope of the practitioner's obligations the practitioner, if so desired by the patient, shall furnish him with a signed recommendation that such treatment should be obtained. A man recently applied to his approved society for ophthalmic benefit and a letter was issued giving instructions as to procedure. He then went to his doctor and asked for a "written recommendation," but as the doctor considered that his headaches were due to nasal catarrh—there was also slight conjunctivitis—treatment was given for the nasal condition, the doctor indicating that the question of possible ophthalmic treatment could be considered later. The patient did not return for further treatment but in due course the doctor received a letter from the society, reminding him of his obligation, stating that the society had been informed that he had declined to issue a recommendation for ophthalmic benefit as in his opinion glasses were not required, and asking quite nicely for a statement from the doctor as to the circumstances of the case. The doctor informed the society of his opinion, but was rather puzzled as to what obligation, if any, had been

infringed. Clearly none at all, for the clause quoted above refers to the condition of the patient, and the mere fact that an insured person thinks he needs glasses, and obtains a letter from his society, cannot compel the doctor to give a written recommendation against his professional judgment. Societies who find the provision of ophthalmic benefit expensive will doubtless welcome the stand taken by this doctor, but it is rather hard that he should have to go to the trouble of explaining his quite proper action.

Amputation of a Finger

Referees appointed by the Ministry of Health pursuant to Article 43 (4) of the Medical Benefit Consolidated Regulations, 1928, have just issued the report of their inquiry which related to a question whether the amputation of the ring finger of the right hand at the metacarpo-phalangeal joint in the circumstances described is within the range of medical service. The operation in question was performed by Dr. X., an insurance doctor, on April 11th, 1935, in the case of Miss Y., an insured person. Dr. X. practises in Cornwall, but there was not sufficient evidence before the referees of any custom or practice of the medical profession which is peculiar to the area in which this question arose, and accordingly in arriving at their decision they did not have regard to any such custom or practice. The inquiry was held at Truro on Jan. 21st, 1936. At the time of the operation the finger was useless, an X ray examination having disclosed necrosis of the bone. The skin covering the proximal phalanx was healthy. The contentions put forward may be summarised as follows:—

ON BEHALF OF THE INSURANCE COMMITTEE AND THE LOCAL MEDICAL COMMITTEE

(1) That the clinical aspects of the case had to be taken into account.

(2) That though there were no circumstances to add difficulty to the operation as a matter of technique by reason of the state of the hand the line of the incision required to be carefully determined so as to avoid the septic area, lest the sepsis should spread to the hand.

(3) That there was a risk of secondary hæmorrhage and that referees appointed under the medical benefit regulations had held, in the case of the removal of thrombosed and varicose veins in the leg with varicose ulcer, that operation was "attended as it is incidentally by a considerable risk of secondary hæmorrhage" not within the range of medical service.

(4) That therefore the operation in question in the circumstances of this case involved the application of special skill and experience of a degree or kind which general practitioners as a class cannot reasonably be expected to possess.

ON BEHALF OF THE MINISTER OF HEALTH

(1) That the operation in question did not involve the application of such special skill or experience as aforesaid.

(2) That the difficulty of determining the line of the incision was not such as to demand in the circumstances of this case such special skill or experience as aforesaid.

(3) That the risk of secondary hæmorrhage in the hand was not comparable either in respect of its probability or difficulty of control to that risk in the leg and that therefore the decision of the referees in the case cited on behalf of the insurance committee was not an authority supporting that committee's contention.

Having considered the evidence submitted and the contentions summarised above, the referees accepted those of the Minister of Health and were satisfied that the operation in question did not involve the application of special skill and experience of a degree or kind which general practitioners as a class cannot reasonably be expected to possess.

CORRESPONDENCE

PROTECTION OF SCIENCE AND LEARNING

To the Editor of THE LANCET

SIR,—The Academic Assistance Council was formed in May, 1933, to assist scholars and scientists who, on grounds of religion, race, or opinion, were unable to continue their work in their own country. Its services have been needed chiefly to help the 1300 university teachers displaced in Germany, but it has also assisted refugee scholars from Russia, Portugal, and other countries.

In coöperation with other organisations, the Council has assisted in permanently re-establishing 363 of the 700 displaced scholars who left Germany. A further 324 are still being temporarily maintained in universities and learned institutions while seeking more permanent positions. The Council has directly received over £46,000 in donations which, with the exception of the small amount used for paying fares of displaced scholars to positions overseas, administrative expenses, and other incidental purposes, have been employed in subsidising research by our refugee guests. The Council, as the international centre for this work, has built up a place-finding organisation and information service which are proving of increasing usefulness.

The Council hoped that its work might be required for only a temporary period, but is now convinced that there is need for a permanent body to assist scholars who are victims of political and religious persecutions. The devastation of the German universities still continues; not only university teachers of Jewish descent, but many others who are regarded as "politically unreliable" are being prevented from making their contribution to the common cause of scholarship.

The Council has decided to establish as its permanent successor a Society for the Protection of Science and Learning, which will continue the Council's various forms of assistance to scholars of any country who, on grounds of religion, race, or opinion, are unable to carry on the scientific work for which they are qualified. One function of the Society will be to build up an academic assistance fund to award research fellowships, tenable in the universities of Great Britain and other countries by the most distinguished of the refugee scholars. This fund will be administered under the auspices of His Grace the Archbishop of Canterbury, the president of the Royal Society, the president of the British Academy, Lord Horder, the Hon. R. H. Brand, and myself.

I appeal confidently and urgently to all those who wish to assist in the defence of free learning and science to join the Society by paying a minimum annual subscription of one guinea. I hope that many will make a larger donation either to the Society or to the fund, or will undertake to covenant with the Society for a seven-year contribution, thus allowing us to recover income-tax on the donations. Gifts to the fund may be earmarked if desired for the establishment of particular fellowships or studentships bearing the name of the donor. This appeal is made with the full coöperation of the organisers of the National Christian Appeal which is about to be made for the destitute non-Jewish refugees from Germany, since the Society will be giving assistance to only one section—namely, the scholars, among the German refugees, irrespective of their religious

affiliations. It is therefore with confidence that I ask support from both the Christian and the Jewish world, and in particular from the university world, to place this most important part of the refugee work on a firm financial basis.

Contributions and subscriptions should be sent to me at the offices of the Academic Assistance Council, 12, Clement's Inn-passage, Clare Market, W.C. 2, made payable to the "Academic Assistance Council."

I am, Sir, yours faithfully,

RUTHERFORD,

President of the Academic Assistance Council.

March, 1936.

THE NUTRITION QUESTION

To the Editor of THE LANCET

SIR,—Dr. Hutchison omits an important point from his quotation from Dr. Friend's "The School-boy." Dr. Friend says that "probably a considerable proportion of the observed increase" (of septic conditions, since 1923) "is due to the fact that about that year the regulations as to sending boys to the infirmary were more strictly enforced, and treatment in the houses was no longer allowed." Dr. Hutchison does not mention Dr. Friend's most striking observation: that the attack-rate of fractures went up in a surprising manner during the period when the boys had vegetable margarine instead of butter, and fell promptly when butter was used again; surely satisfactory evidence of the protective action of this dairy product. Nor does Dr. Hutchison mention that during the period of war shortage, coincidentally with the physical regression, an increasing number of boys showed a disability to cope adequately with the normal school routine; nor the fall in the incidence of acute and subacute rheumatism after the increase of fat in the diet. Surely if Dr. Friend's very qualified evidence about septic conditions is worth quoting, his unqualified evidence on other points is worth quoting also. Strangely enough, Dr. Hutchison also omits the most convincing piece of evidence in support of his thesis—the increased frequency of complications of influenza since the boys have been on a more generous diet.

Dr. Hutchison contradicts himself when he first ascribes lowered resistance to tuberculosis to a deficiency of fat in the diet, and later maintains that there is no proof that dairy products protect us against any of the great killing diseases. The fact that tuberculosis is declining may be evidence that the nutrition of the country is better than it was. But tuberculosis still kills about 30,000 a year; there is still much room for improvement. The death-rate from diabetes is only about one-fifth of this. Even if the increase in the prevalence of diabetes is due to an increase of over-eating, the choice before us is not between under-feeding with the danger of tuberculosis and over-eating with the danger of diabetes. There are such things as common sense and moderation.

It is true that Dr. Spence says that, in his opinion, the main immediate cause of the apparent malnutrition of city children in Newcastle is the physical damage done by infective disease; but he also ascribes the failure of the children to recover equally to housing conditions and inadequate diet. Dr. Hutchison was a member of the committee appointed by the British Medical Association to determine the minimum expenditure on diet compatible with

health and working capacity. As the report of the committee was published without any reservations by Dr. Hutchison it may be assumed that he accepted their conclusions. The Newcastle report, in which Dr. Spence's observations appear, and numerous other surveys show that a considerable proportion of families cannot afford, and actually do not get, diets up to the standard of this committee's minimum. This applies particularly to families with young children.

I am, Sir, yours faithfully,
Bishops Stortford, March 22nd. JOHN MARRACK.

THE ZÜND-BURGUET TREATMENT

To the Editor of THE LANCET

SIR,—My attention has been drawn to Mr. Barwell's assertion in his article on Prognosis in Deafness (THE LANCET, Jan. 25th, p. 214) that the results of the Zünd-Burguet treatment "appear to be evanescent." As one who has had ten years' uninterrupted experience of the electrophonoïde method, I feel it incumbent on me vigorously to deny this aspersion upon what I firmly believe to be a valuable treatment when properly understood and properly applied. A quarter of a century ago, at an annual congress of the Société Française d'Oto-Rhino-Laryngologie, a lively discussion on this subject was closed unanswerably by a member with the words, "My dear colleagues, the outcome of this long discussion is that those who understand the method of Zünd-Burguet are favourable to it, while those who know nothing about it are unfavourable to it." Apparently the situation to-day is exactly similar.

Out of a record of some four hundred cases I would quote the following as examples of permanent improvement:—

(1) A girl of 16, suffering from chronic catarrhal deafness, who in three years has improved for the voice hearing from R. 8", L. 18" to R. 78", L. 240" and is thus able to earn her living as a typist. (2) A lady who, at 21, experienced an attack of unilateral subacute otitis which left her with a reduction of voice hearing in one ear to 24", and a severe, increasing vertigo which incapacitated her for three years. She underwent fifty treatments, with the result that the vertigo disappeared after ten sittings and has never returned, and the hearing became normal. She has remained thus normal for a period of nine years and has become an ardent mountaineer. (3) A lady of 22 with otosclerosis (so diagnosed by several otologists). Treatment in 1925 brought a voice hearing of R. 14", L. 4" after fifty sittings to R. and L. 180". She has kept touch with me and has not gone back. She is now earning her living as a teacher. (4) A lady of 29, also a case of otosclerosis. Whisper hearing in 1932 was R. 10", L. 15". In 1933 it had reached, under the electrophonoïde treatment, R. and L. 240", an improvement which has so far (1936) remained permanent. (5) A lady of 39, who became deaf in one ear from mumps in 1927. I was lucky enough to get her under treatment within a month of its onset. This case was successful and the result has been retained. Details will be found in the *Clinical Journal* for Feb. 8th, 1928.

My results in cases of presbycusis were published in your columns (1934, ii., 306) and speak for themselves. The cases just quoted are but a very small tithe of examples of permanent successes that I have obtained. The two greatest factors in such results are *perseverance* and *coöperation* on the part of both patient and surgeon. Some of my patients have obtained lasting results in a comparatively short time; others have done so only after two years. These essentials do not appear to be appreciated by those who have derided the Zünd-Burguet method. I need hardly mention, in addition, that appropriate

constitutional treatment is a necessary concomitant. This point I have endeavoured to make clear in my "Otosclerosis" (London, 1933).

I am, Sir, yours faithfully,
Harley-street, W., March 19th. MACLEOD YEARSLEY.

PROGNOSIS IN SPINAL CARIES

To the Editor of THE LANCET

SIR,—I am glad to read Sir Henry Gauvain's elucidation of the points I raised. I feel that his letter forms a valuable addendum to what he had already written. At the same time I am sorry to note that the word "discharged" is acquiring a double meaning. I am aware that in the services the letters D.D. are being used to designate fatalities, but in this case the outcome is specified by the qualification discharged dead. It was this word "discharged" that led me astray as I associate this word with the hospital's designation for cases which have left the institution cured, relieved, or incurable. I am correcting the figures in my own copy of THE LANCET to read:—

Period under review September, 1908, to March 31st, 1935—

Cases admitted	1666	
Still under treatment		84
Discharged—		
Cured, relieved, incurable		1521
Died in hospital		61
	1666	1666

I am, Sir, yours faithfully,
Leeds, March 21st. S. D. PERSY FISHER.

GASTRIC ACIDITY AND ITS SIGNIFICANCE

To the Editor of THE LANCET

SIR,—Dr. Hurst's letter in your issue of Jan. 18th interests me much because Dr. Vanzant and I have recently studied the relations between hæmoglobin and gastric acidity in some 3500 persons with hæmoglobin readings ranging from 25 to 130 per cent. and no demonstrable disease in the stomach and duodenum. We have found that, as the hæmoglobin falls off below 75 per cent. mean gastric acidity decreases, and the incidence of achlorhydria rises.

While making this study we found records of dozens of atypical cases in which, in spite of the presence of a marked secondary anaemia, the acidity was higher than normal. On examining these records we found that in most cases the probability was that the patient had an ulcer; the only reason why the diagnosis had not been made was that the roentgenologist had not been able to see a lesion. We then examined dozens of records of patients with marked anaemia due definitely to bleeding from an ulcer and found in almost every case that the acidity was 10 to 15 points above normal, instead of the 20 or 30 points below normal that was to be expected from our experience with persons with severe hypochromic anaemia and no ulcer.

These observations can now be of great help to the physician who cannot find the cause of a severe secondary anaemia. If the gastric acidity is low, he should continue to search for perhaps a carcinoma of the stomach or caecum or for bleeding hæmorrhoids; but if the acidity is abnormally high, and especially if the patient gives a history suggestive of peptic ulcer, the physician can be almost certain that an ulcer is present, even if it cannot be visualised. As

a corollary of this, when a markedly anæmic patient comes with a diagnosis of duodenal ulcer but a low gastric acidity and perhaps few symptoms of ulcer, the clinician will do well to keep searching for the source of the bleeding because it probably is not in the duodenum. Actually, in several cases like this in which the search was continued at the Mayo Clinic, a bleeding lesion was found in the large bowel.

On re-reading Dr. Hurst's letter, one can easily understand now why 17 of his 41 anæmic patients could have a high gastric acidity. Twenty-one were suffering with duodenal ulcer. All of which shows again that when two able observers disagree it is usually because their methods or their material were different or because some unrecognised extra factor was at work.—I am, Sir, yours faithfully,

WALTER C. ALVAREZ.

Mayo Clinic, Rochester, Minnesota, March 10th.

PRURITUS OF THE VULVA AND ANUS .

To the Editor of THE LANCET

SIR,—May I refer to several points raised by your appreciative and critical annotation on the subject of my papers in your issue of March 14th (p. 617). While it is true that the incidence of skin eruptions at any site may "cause" the symptom of pruritus at that site, until the ætiology of the skin eruptions is determined can any claim to have established the "cause" of their symptoms be upheld? The differentiation of the different types of skin eruptions in which irritation of the vulva is a prominent symptom, when the eruption occurs on the vulva, does not solve the ætiology of these eruptions. The ætiology of many eruptions is still unknown. I submit that generally the various types of skin eruptions which occur on the vulva are not differentiated, but that they are merely classified under their most prominent symptom and are called "pruritus vulvæ."

Your annotation expresses surprise at the infrequency of ringworm. Scrapings from suspected cases were in fact negative, and, if results of treatment can be regarded as diagnostic, cure was obtained without the use of fungicides. In regard to the absence from my list of pruritus of "a menopausal or endocrine" origin, does not such a diagnosis involve the assumption that the skin of the vulva is governed by internal factors which have no influence on the skin at any other site? I am unaware of any records of cases of generalised pruritus, or of pruritus at sites remote from the vulva, in which this diagnosis has been definitely established, and in which no skin changes were present. It is a facile diagnosis, acceptable to the patient, since it often confirms her own opinion, and it absolves from further examination of the parts. It is also in harmony with the opinion which is very commonly accepted that the skin of the vulva is a pelvic organ: as the expression goes, "pruritus vulvæ belongs to the gynæcologist." It is for this reason that cases of vulval pruritus are rare in the skin clinics of general hospitals; they are more commonly referred to gynæcological clinics. Few, if any, gynæcologists claim a specialised knowledge of skin affections, and the absence of a differential diagnosis of vulvar skin eruptions is therefore not surprising.

Dr. Agnes Savill's conclusions in your issue of March 21st raise the curious problem as to why fæcal organisms should suddenly become pathogenic to the skin, for even with the most careful hygiene it is inevitable that the parts near the anus should be contaminated by these organisms, from infancy

upwards. Analysis of a large number of urines in my cases yielded such varied results that no definite conclusions could be drawn from them, and irritation appeared to be equally acute in the patient with a neutral sterile urine; with a urine loaded with phosphates; or with a urine in which there was an excess of oxalates, as in the cases in which cultures of *B. coli* were obtained. The analysis and treatment of vaginal discharges do not usually fall within the province of the skin physician, but the results of treatment may, particularly where the patient has some idiosyncrasy.

I have had one case of anal irritation due to worms, but as the eruption did not involve the vulva, this case was not included in the series recorded.

I am, Sir, yours faithfully,

ELIZABETH HUNT.

Manchester-square, London, W., March 23rd.

EPILEPSY AND ALLERGY

To the Editor of THE LANCET

SIR,—The interesting case recorded by Drs. Costello and Fox in your last issue, with reference to an unusual relationship between asthma and epilepsy, raises the question of whether epilepsy can be associated with allergy. I have recently seen in consultation an almost identical case, except that epilepsy was preceded by migraine which invariably culminated after a few hours in either petit or grand mal, on the occurrence of which the migraine ceased. The skin tests to foods, &c., all proved negative. The patient, a woman of 22, had suffered from migraine and epilepsy for many years, and the case may be of interest as affording additional evidence that some cases of epilepsy may be of allergic origin. As far as could be ascertained, there was no family history of allergy. The cyanosis referred to by Drs. Costello and Fox was not, of course, present in a case of migraine, but information as to the mechanisms of the two conditions would be of interest.

I am, Sir, yours faithfully,

Harley-street, W., March 23rd.

G. H. ORIEL.

MORAL PROBLEMS IN HOSPITAL PRACTICE

To the Editor of THE LANCET

SIR,—The American work with this title by Father Patrick A. Finney, C.M., reviewed in your issue of March 14th (p. 640), has already been severely criticised in the October, 1935, number of the *Catholic Medical Guardian*, the organ of the Catholic Doctors' Guild. The "nihil obstat," and other marks of ecclesiastical approval that it bears, certainly imply that the book contains no actually heretical teaching, but they do not guarantee that the author will command universal acceptance by his co-religionists in his application of Catholic principles to medical practice. On one important question Father Finney has failed to distinguish between a decided and binding dogma of the Church and a matter on which opinion is divided—viz., ectopic gestation. Catholic doctors in this country are advised that operation on the unruptured tube is perfectly permissible, since the tube is in a diseased state, and they do in fact carry out the usual procedure in treating this condition.

We entirely concur that "the conduct which is enjoined by Father Finney on hospital sisters" is contrary to the accepted relationship between the medical and nursing professions in this country and places a quite unsuitable responsibility on the nursing sister. Naturally it is assumed that in hospitals conducted under Catholic auspices operations

definitely regarded as unlawful by Catholics, such as direct abortion and sterilisation, cannot be performed, but this does not in our opinion justify turning a nurse into the surgeon's invigilator. It appears, however, that in America the situation is different to anything that prevails in Europe, and there are many Catholic hospitals owned and managed by Catholic religious orders which have no Catholic doctor on the staff and no priest readily available.

Finally we would point out that since Catholics attach much greater importance to the sacrament of baptism than do many others, it is necessary to give particular and detailed instructions to the nurses in the interests of the child. Here again, however, we must admit that Father Finney goes far beyond the common interpretation of medical obligation, and also of medical practice. The "duty" to baptise the unborn child is strictly conditioned by a further obligation not to mishandle the dead mother uselessly or to endanger the living. It is hardly conceivable that nurses should perform post-mortem Cæsarean sections or that they should rupture the membranes in order to baptise an infant only possibly alive! Few Catholic doctors in the course of a long professional life feel called upon to do either of these things.

The Catholic faith is rational and seeks to conserve life, the life of the body and the life of the soul. It is unfortunate if its aims should be misunderstood through an interpretation tinged perhaps with excess of zeal.—I am, Sir, yours faithfully,

ERNEST E. WARE,

March 22nd.

Master of the Catholic Doctors' Guild.

THE FUTURE OF THE CORONER

To the Editor of THE LANCET

SIR,—I have been much interested in the controversy about the coroner system which has been discussed during the past year in your columns and was the subject of a leading article in your issue of Feb. 15th. As a result of similar scandals arising in the coroner system in Suffolk County, Massachusetts, which includes Boston, the coroner system was abolished in this State by legislative act in 1877. The Massachusetts Bar Association and the Massachusetts Medical Society through their joint action brought about this change. They based their criticisms upon the following:

1. The coroner was required to exercise both medical and legal functions, a straddling of two professions, difficult to compass even for an exceptionally brilliant person.

2. The office of coroner, while perhaps necessary under the primitive conditions existing in the early Anglo-Saxon period, had become an anachronism following the development of police and judicial systems.

3. In the investigation of a death by violence two primary questions present themselves: (a) what caused the death? the answer to which can only be supplied by medical investigation; (b) who caused the death? a matter for the police and the courts to determine.

Under the Massachusetts medical examiner system, medical men are called upon to determine the cause and, if possible from the medical facts disclosed, the manner of the death, in cases in which death is supposed to be due to violence. Inquests are limited to cases in which death may have been due to the act or negligence of another, and are held before a judge of a court of first instance, without a jury. If probable cause of action is found the suspect is held for grand jury investigation, and if an indictment is issued the evidence is presented before a superior court with jury. Within the recent period inquests have been sharply limited. Deaths under anaes-

thetics, for example, are not inquested unless there is an indication of criminal negligence. In most other cases the police and the lower courts have already taken cognisance of the matter before the medical investigation has been completed in detail.

The medical examiner system has been subjected to 58 years of trial in this jurisdiction and has been adopted in neighbouring States, in New York City, and in Essex County, New Jersey. As I have suggested, the system makes for simplicity, utility, and efficiency.

I am, Sir, yours faithfully,

TIMOTHY LEARY,

Medical Examiner, Suffolk County, Massachusetts.
Boston, March 10th.

AN ADDRESS IN HARLEY STREET

To the Editor of THE LANCET

SIR,—In your issue of March 14th you published a letter with reference to medical refugees in this country. I have consulted the Jewish authorities interested in the question and find that to the best of their knowledge about 140 German doctors have received permission to practise here, of whom 35 have been permitted to practise in the Harley-street area. This latter group consists of men of specialist rank in their own country. To see these figures in their proper perspective, may I add that there are about 57,000 names on the Medical Register and I believe there are about 40,000 doctors in practice in Great Britain.

I am, Sir, yours faithfully,

March 24th.

SAMSON WRIGHT.

THE RECORD BREAKER

To the Editor of THE LANCET

SIR,—In your account last week (p. 664) of the discussion on Fatigue at the Hunterian Society I am reported as having said that "the record breaker was not usually the educated person." I shall be obliged for the opportunity to correct this misstatement which is likely to call forth a storm of indignant protest; in fact, premonitory rumbles have already reached me. In replying to questions, I had endeavoured to differentiate athletic psychological types, in particular contrasting the highly strung, usually encountered in the devotees of events of speed and those demanding accuracy of technique, with the more stolid unemotional participants in long-distance events and feats of endurance. The great majority of the former belong to what for convenience one terms the educated class; with rare exceptions the latter are manual workers. No mention of "record-breaking" was made: were this under consideration, an analysis would show that the educated and, on occasion, the very highly educated are well represented.

I am, Sir, yours faithfully,

Brook-street, W., March 21st. ADOLPHE ABRAHAMS.

A QUESTION OF PROFESSIONAL CONFIDENCE

To the Editor of THE LANCET

SIR,—The letter of Iatros moves me to send you particulars of another tragedy also revolving round the gonococcus, though in this case I am happy to add that the patient has not suffered.

Dr. A, practising in contract with the X insurance committee, treated his patient Miss N for acute gonococcal vaginitis and endometritis and when she was convalescent sent her into the area of Dr. B, practising in contract

with the Y insurance committee. Before she made the journey to stay with her aunt, who with her husband are valued patients of Dr. B's, Dr. A wrote to Dr. B saying "you will shortly be asked to accept as a temporary resident Miss N" and giving particulars. While Miss N was under his care Dr. B had occasion to inform Dr. A of her progress both by telephone and by letter, eventually returning her to his care with a final letter. Then came the completion of the temporary record form. Dr. B, having some acquaintance with the organisation of the Y insurance committee's office and knowing girls were in employment there, did not feel inclined to make a diagnosis of gonorrhœa which might meet their eye; he further had a delicacy about possible publication within a few miles of the residence of the patient's uncle and aunt of a fact which he had managed to avoid telling them when the patient was actually under treatment in their house—namely, that their unmarried niece had acquired venereal disease. He therefore completed the form so far as was necessary to inform Dr. A of facts not included in the direct correspondence.

The clerk to the Y insurance committee thereupon returned the record form on the ground that it contained insufficient professional details; and also acted in the same way in a similar case. Dr. B saw no reason to alter a form which he had every reason to consider satisfactory to Dr. A; and, since the action of the clerk constituted evidence that his professional statements were scrutinised by a layman, to wit, the clerk, he had every reason to avoid giving details which would constitute a breach of professional confidence. He has therefore in cases where there is reasonable ground to suppose patients would object to disclosure of details treated them without acceptance as temporary residents, to the detriment of his pocket but the integrity of his reputation. He obviously cannot return records which the clerk has already refused to accept and forward; and every reason to decline to amplify them to satisfy the clerk.

Since these occurrences the clerk has included the two temporary record forms in complaints made by him against Dr. B, and at the hearing of the first of these complaints stated that two of the temporary record forms had been returned by him because they were not full enough, and Dr. B had failed to return the same. This statement passed unchallenged by any of the members of the medical service sub-committee which has twice recommended deductions from Dr. B's remuneration for delay in returning medical records of which these are two. Dr. B cannot explain himself to the insurance committee without breaking confidence; and when he challenges the right of the clerk to return records for reasons connected with professional information and comments that another insurance committee known to him make provision for the forwarding of such records from one practitioner to another under cover, the committee reply that they "join issue."

I am, Sir, yours faithfully,

March 21st.

IATROS II.

To the Editor of THE LANCET

SIR,—I was much interested in the letter of "Iatros" last week and in your reply, as I have recently dealt with a similar case. As the letter reads, and with the lack of fuller information, Dr. A was in my opinion absolutely right in the action he took and in giving the information he did to the girl's mistress. Granted that it was not strict etiquette to examine the bed letter, at any rate the girl was Dr. A's patient and the inspection of the letter was made quite openly in the presence of the nurse. Evidently some condition was present quite different from an acute abdomen. In a general hospital, as this obviously was, a girl is not placed in

a V.D. ward without the corroboration and positive evidence which the hospital is capable of obtaining and verifying; we may be sure that the girl was suffering from a gonococcal infection.

For myself I rather blame the physician in charge of the case that he did not advise Dr. A that the girl was not a case of "acute abdomen" for which she had been sent to the hospital. Knowing what Dr. A did (apart from his inspection of the bed letter) was he to allow this girl to return to an unsuspecting mistress who would continue to believe that the girl's past had been a creditable one, to a house where perhaps there were young children, where perhaps she would use the same towels and sleep in the same room with another maid? Which of us would like this to happen in our own house? Knowing the months these cases often take to be cured, is it probable that a general hospital would keep a patient all this time, and what about recrudescence after apparent cure? One is, I am afraid, a trifle suspicious of these girls with a "highly creditable record" and in any case she would not remain innocent long after a stay in the V.D. ward of a general hospital. What alternative had Dr. A, and what would have been his position if as a result of his silence others had become infected? The dismissal was perhaps sent rather crudely and suddenly to a girl with a highly creditable record—hence her hysterical state. It might have been wiser if Dr. A and the mistress had decided to tell the girl that the illness would be a long one and that the mistress could not await her return.

In your note you mention that the condition present might have been confused with other conditions such as effects produced by contraceptive measures. This would not be very creditable to the bacteriological staff of a general hospital, and the fact that she was in a V.D. ward should justify Dr. A in the action he took.

I am, Sir, yours faithfully,

March 22nd.

F.R.C.S.

A DISCLAIMER.—We have received from Dr. Stanley Hartfall and Dr. Hugh Garland a disclaimer of any association with the recent publicity given in the press to the gold treatment of rheumatoid arthritis. The connexion of their names, they state, with the articles in question has been due to the action of a news agency which has circulated paragraphs taken from a short communication by them to the last number of the Leeds Medical Society Magazine.

PARIS

(FROM OUR OWN CORRESPONDENT)

DEATH OF ARNOLD NETTER

AFTER addressing a meeting in Paris on March 1st of the Assemblée française de Médecine Générale, Dr. Arnold Netter died suddenly while the discussion was still in progress. Professor of the faculty of medicine of Paris and honorary physician to the Trousseau Hospital, he had distinguished himself as a pædiatrician and had made valuable studies of broncho-pneumonia, cerebro-spinal meningitis, infantile paralysis, and lethargic encephalitis; his work on the relationship between zona and chicken-pox was also of considerable value. The dramatic circumstances of his death are reminiscent of a scene at the Academy of Sciences, before which Dr. Lucas-Championnière was presenting a report when he collapsed suddenly and died. Dr. Netter was an

octogenarian, but his last discourse, on the fixation abscess with special reference to its use in encephalitis, had won applause for its intrinsic merits as well as in tribute to its author's personality. It may be noted that the opinion of the meeting seemed strongly in favour of the use of fixation abscesses in many forms of illness; though a more critical attitude was maintained in at least one quarter.

CREMATION IN FRANCE

In the March number of *Annales d'hygiène* Dr. Emile Malespine has published a historical survey, conceived in a philosophical spirit, of the disposal of the dead. As he points out, the mode of destruction of a dead body is far less complicated than the psychological and spiritual problems connected with it. "The problem of the cadaver is inseparable from the problem of the cult of the dead, and this cult has its roots in the deepest forces of humanity and the spirit of religion, and it dominates the social life. A nation loses its *raison d'être*, a nation dies if it no longer feels the mysterious threads attaching it to its dead and to the past." It was during the French Revolution that the idea of cremation took concrete form in a project for its realisation, but this project was referred back to a commission in which it was duly buried. It was not till 1874 that cremation was again considered as a practicable solution of the problem of the disposal of the dead. In this year the bodies of three women were cremated in Germany in a Siemens furnace. The idea spread, and soon schemes were afoot for the creation of crematoria in most of the large towns of Europe. In 1889 the crematorium of Père-Lachaise in Paris was inaugurated, and in the same year 49 cremations were effected in this centre. Since then there has, indeed, been a steady rise in the number in Paris, from one decade to another, but the figures certainly do not testify to any great and popular movement in favour of this mode of disposal of the dead. Thus in 1890 there were 121 cremations. In 1900 the number rose to 297, and in 1910 to 473. There were 560 cremations in 1920, 899 in 1930, and 904 in 1934. At the present time cremation is requested in barely 1 per 1000 deaths, and it does not seem as if in France it is likely to make great headway. Why? Dr. Malespine is careful to avoid specific references to the attitude of the Roman Catholic Church to cremation, and he seems more inclined to be philosophically resigned over, than to tilt against, those psychological inhibitions which play so important a part after as well as during life. Respect for the dead cannot be contemptuously dismissed with such a catchword as "fetishism of the cadaver."

CENTENARY OF THE ROYAL MEDICAL BENEVOLENT FUND

THE hundredth annual general meeting of the supporters of the Fund was held in the library of the Medical Society of London on Tuesday last, March 24th, at 5 P.M., Sir THOMAS BARLOW, president of the Fund, presiding. The members stood in silence for a brief space in respectful tribute to his late Majesty, King George V., a patron of the Fund since 1913.

Mr. R. M. HANDFIELD-JONES, hon. secretary, then presented the annual report. He said that the annual meetings were purely formal and designed to meet statutory requirements. But he was able to state that the president had invited the honorary local secretaries to meet at his house to discuss an

appeal to be made in April and sent to everyone on the Medical Register, except where a benevolent fund is already in existence. The meeting at Sir Thomas Barlow's house would discuss how the appeal can be made more powerful. With the same object a conversation will be held shortly, when the Royal Society of Medicine has offered the use of its premises and have asked the members of the Fund to be their guests.

ANNUAL REPORT

He then read the report which showed a story of expansion, very slow at first but substantial of recent years. For example, while in early days the annual subscriptions never exceeded £2250, by the ninetieth year of the Fund the income from this source had risen to £7000 and had reached £14,500 in the centenary year. The committee however had had to expend nearly £700 in annual grants more than was actually received in income during the year, so numerous and urgent had been the appeals. By the jubilee year of the Fund (1886) the Fund had distributed £60,000 among the less fortunate members of the profession; by the centenary year close on £400,000 had been thus expended. The report concluded by stating that a brief historical record of its activities, written by Sir Humphry Rolleston, would be issued in April with the general appeal to practitioners.

Commenting on the report Sir THOMAS BARLOW remarked that he did not know of a charity which displayed more kindness in the way it was administered.

FINANCIAL STATEMENT

Dr. LEWIS G. GLOVER, hon. treasurer, in presenting the accounts, pointed out that from January to December grants are allocated carrying on for the next year, thus committing the Fund to a large expenditure in the immediate future. The Fund was solvent but care had to be exercised over expenditure. The number of grants and annuities had increased by 138 over the previous year; in 1935 there were 240 more beneficiaries than in 1927. The money invested at the moment was £225,000; £2058 had been received through the B.M.A., allocated by subscribers to the Fund. The actual amount of money distributed was £2415 more than was given in the last year, including £865 for Christmas gifts, money resulting from Sir Thomas Barlow's letter in the medical press at Christmas, and from collections at meetings, mostly B.M.A. and panel committees. £1123 were received from the Ladies' Guild as the proceeds of a charity *matinée*, and £207 from the provinces as the result of dinners and dances and social functions held in aid of the Fund. The working expenses were 9 per cent. this year as against 9.3 per cent. last year, and he would point out that societies analogous to their own in calculating percentage of working expenses take into account all money received in legacies, in which case the expenses of the Fund would be only 5 per cent. of the total income received.

Dr. W. P. S. BRANSON expressed the gratitude of the meeting to the honorary officials of the Fund, and Dr. HERBERT SPENCER, who seconded the proposal, said he thought £100,000 would be a good figure to aim at for the centenary appeal.

At the conclusion of the meeting the hon. treasurer announced, relative to the special appeal which is to be issued in April, that Sir Thomas Barlow had headed the list of contributors to the centenary fund by a donation of £1000.

OBITUARY

ALEXANDER ROBERT TWEEDIE, F.R.C.S. Eng.
 AURAL SURGEON, NOTTINGHAM GENERAL HOSPITAL

THE death of Mr. Tweedie, the well-known otologist and laryngologist of Nottingham, occurred suddenly in Nottingham on Wednesday, March 18th.

Alexander Tweedie received his medical education at St. Bartholomew's Hospital, entering the medical school with a scholarship, qualified in 1900 with the English double diplomas, and in the following year obtained the F.R.C.S. Eng. After qualification he did post-graduate work in Vienna and then held a resident appointment at the Royal Free Hospital, but having selected laryngology as a specialty he became clinical assistant to the Hospital for Diseases of the Throat, Golden-square. He then went into practice in Nottingham where he was prompt to make his mark. He was elected assistant surgeon to the Nottingham General Hospital and to the Children's Hospital, and also held the appointment of aural surgeon to the Midland Institution for the Blind. In the South African war he served as civil surgeon in the South African Field Force. On his return to practice he became surgeon to the ear, nose, and throat department of the General Hospital and laryngologist to the Nottingham City Mental Hospital, and soon had a large consulting practice. As the result of these varied experiences he made well-informed communications to the *Journal of Laryngology, Rhinology, and Otology*—to the staff of which journal he was attached—to the *British Medical Journal*, the *British Dental Journal*, *The Lancet*, and the *Journal of the R.A.M.C.*, while in collaboration with Keith he contributed to the *Proceedings* of the Royal Society of Medicine a communication on congenital anomalies of nose, palate, and upper lip. This does not exhaust his communications to the *Proceedings* of this society, while he was a useful contributor to the debates and became president of the otological section. He was a prominent member of the Nottingham Medico-Chirurgical Society and an ex-president of this society. He was a corresponding member of the Austrian Otological Society and the Paris Society of Laryngologists, and treasurer of the Oto-rhino-laryngological Collegium.

Tweedie did fine and varied service during the European war. He personally raised a second line of ambulances and went overseas to be present at the opening of the Gallipoli campaign. He had under his administration a large medical organisation at Alexandria, served in the expedition to Tripoli against the Senuse, and had at one time charge in upper Egypt of a large medical district where he was commanding officer at the Citadel Hospital, Cairo. He was present at the final assault on Gaza as medical officer to one of the divisions, and joined in the pursuit of the Turks to Jaffa and Jerusalem. He was demobilised with the rank of lieutenant-colonel and was mentioned in dispatches. After the war, on his return to Nottingham, he found time in addition to the care of his practice to play an important part in the institutional care of the deaf and of the blind while also acting as local aural specialist to the Ministry of Pensions. In 1920 he was elected to the Nottingham City Council and served on various committees in connexion with health, care of mental deficiency, and management of asylums, but he did not seek re-election at the end of his term.

His death occurred in a dramatic manner. He had been present at a scientific meeting in Nottingham

and had just spoken the closing words of the meeting when he suddenly collapsed and died. He was not known to have been in ill-health.

THOMAS MAJOR TIBBETTS, M.D.,
 D.P.H. Lond.

Dr. T. M. Tibbetts, whose sudden death occurred at the age of 67 on March 13th, was a well-known practitioner in Cradley Heath and the surrounding country. He received his medical training in Birmingham and graduated as M.B. in 1892, taking the D.P.H. of the English Royal Colleges a little later. His whole professional life was passed in the Cradley Heath district where his services to public health were varied and valuable. He was for 40 years M.O.H. to the Quarry Bank U.D.C., and in his reports made outspoken attacks on sanitary defaults of overcrowding and other abuses. He became accepted as a leading authority on these subjects, while on the institution of the National Health Insurance system his activity on behalf of the great movement in the early days was of great local influence. In 1916 he wrote a useful treatise on the "Duties and Perplexities of the Panel Doctor." He treated the subject with breezy cheerfulness and plain good sense, and though not forgetting the duties and obligations of the medical man towards his profession, pointed to the duties, owed by the profession to the State, which by the National Insurance Acts were brought into the form of a contract. Dr. Tibbetts is survived by his wife, a daughter, and three sons, one of whom, Dr. A. Tibbetts, was practising in partnership with him.

SIR KEDARNATH DAS, C.I.E., M.D. Calcutta

Sir Kedarnath Das, whose death is announced from Calcutta, was principal of the Carmichael Medical College, and professor of obstetrics and midwifery there. Born in 1867, he was educated at the Scottish Churches College and Calcutta Medical College, and graduated in 1892. His appointment to the Carmichael College came in 1919 after long service to the Campbell Medical School, and he has for many years been the doyen of the medical profession in Calcutta. To Mr. V. B. Green-Armytage we are indebted for the following appreciation of his former colleague:—

"Kedarnath Das was a man of outstanding ability and striking appearance, standing well over 6 feet in height. Exceedingly well read, his main hobby was his library and the collection of data for his monumental work, 'The Obstetrics Forceps—Its History and Evolution,' which meant 12 years of unremitting patient toil and involved an enormous amount of cross-correspondence between authorities throughout the world; and when it is remembered that this correspondence was done in his own handwriting, working in a climate not conducive to burning the midnight oil, with a fan whirring above, winged insects buzzing around and sweat pouring down his arms, one must but applaud his inspired enthusiasm and admit that he produced the only masterpiece on this subject that has ever been published in the English language.

"Kedarnath Das was India's greatest obstetric guru, and wrote innumerable articles on his own speciality. The honours he received gave pleasure to all because they were well earned by integrity, loyalty, and sheer personal merit. He was much

beloved by all his professional brethren, and as a consultant and administrator, his experience and acumen was of the utmost value. He was particularly proud of the fact that he was the first Goodeve Scholar at the Eden Hospital, and was in close touch with it and its professors throughout his life.

"Whatever he did, he did thoroughly with punctilious care as regards detail and procedure, and I remember when we first opened the DumDum Aerodrome, he was one of the earliest to join, and although well over 60, was one of the first to make a flight over Calcutta, taking intense joy that he was thereby inspiring the youth of Bengal to become air-minded. His house was ever open to all medical men in Calcutta and many a pleasant afternoon I have spent there. Nothing gave him more pleasure than showing you round his library and then taking you to the Carmichael Hospital to demonstrate his unique collection of forceps and appliances which he had procured from all over the world, and which he had presented to the hospital museum."

Sir Kedarnath Das was a foundation fellow of the British College of Obstetricians and Gynæcologists and an honorary fellow of the American Association of Obstetricians. He was knighted in 1932.

WILLIAM HOLLAND WILMER, M.D. Virginia

WE announced last week the death of William Wilmer, the distinguished American ophthalmologist and director of the Wilmer Ophthalmological Institute, Baltimore. His name is well known in this country where certain of his patients enjoyed prominent public positions.

Born in 1863, the son of Richard Wilmer, the bishop of Alabama, he received his medical education at the University of Virginia, graduated in medicine there in 1885, and undertook a long course of post-graduate study in his own country and in England. He contributed to scientific journals articles on various aspects of ophthalmology and also on medical aviation in which he was greatly interested. At the seventeenth annual conference of the Oxford Ophthalmological Congress he delivered a very good address on



DR. WILMER

the results of the operative treatment of glaucoma.

At the outbreak of war Wilmer already held a commission in the medical reserve corps of the U.S. Army. He became appointed commandant of the Medical Research Laboratories (Air Service), Long Island, and at the close of hostilities was in surgical charge of the air service of the U.S.A. Expeditionary Forces. He was awarded for his services the D.S.M. medal in 1919 and was later appointed a Commander of the Legion of Honour. His professional, philanthropic, and social duties in his own country were numberless, and at the time of

his death he was professor of ophthalmology at the Johns Hopkins University and director of the associated Wilmer Ophthalmological Institute. This institute expresses a desire among Wilmer's patients and friends that a wide scope should be given to his activities and that his name should be commemorated in connexion with them. In coöperation with the Rockefeller Foundation and the Commonwealth Fund a sum of nearly four million dollars was raised and the Wilmer Ophthalmological Institute was started providing an opportunity for the study of every phase of ophthalmology. In 1929 General Wilmer was elected president of the Association of Military Surgeons of the United States.

DOROTHY MABEL HANSON, M.B. Liverp.

WE regret to announce the tragic death, on March 21st, of Dr. Dorothy Mabel Hanson, who was killed instantly when her car was crushed between two trams near Westminster Bridge. Dr. Hanson was educated at the Belvedere School, Liverpool, and subsequently studied at the Bergman-Osterberg Physical Training College, Dartford, for at that time she intended to become a teacher of games and gymnastics. After teaching for a year at a school in Southend-on-Sea she went to the Manchester School of Massage to study for the teachers' certificate of the Chartered Society of Massage and Medical Gymnastics. With this qualification she returned to Dartford to teach medical gymnastics, but left again in order to qualify as its medical officer by securing the M.B., B.Ch. degree at the University of Liverpool, her home town. Apart from these years the whole of the rest of her working life was spent in the Dartford College. As lecturer in anatomy and remedial exercises and as resident medical officer she fulfilled two quite distinct functions and therefore had opportunities of coming into perhaps more intimate contact with succeeding generations of students than any other teacher. She was the doyenne of the staff, and for most of those who knew her was so much a part of the College that her sudden and tragic death on March 21st came as a profound shock not only to her present colleagues and pupils, but also to very many others who had passed through the College. She was for many years a member of council and examiner for the Chartered Society, where her specialised knowledge of physical training work and postural problems will be sorely missed. She was only 42 years of age.

ELEANOR HODSON, M.B. Edin.

Dr. Eleanor Hodson, who died on Feb. 26th in Canterbury, had a wide reputation as ophthalmologist and social worker. She was a native of Mickleover, Derbyshire, graduated at the University of Edinburgh as M.B., B.Ch. in 1900, and after serving for a time as house surgeon to the National Eye Hospital, Dublin, went to Calcutta where she practised for some years as a specialist in diseases of the eye. On her return to England she continued to carry on her ophthalmological work, travelled much, and grew interested in many aspects of continental life, while in England she became known as a fine rider to hounds. At the outbreak of war, failing to obtain appointment as a specialist with the British Army, she became attached to the Croix Rouge and during the first period of operations was in charge of various French hospitals. Invalided home in the later phases of the war, she was invited to serve with the R.A.M.C.

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PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Nutrition and National Health

THE DEBATE IN THE LORDS

IN the House of Lords on March 18th the Bishop of WINCHESTER asked H.M. Government if in view of widespread malnutrition and the existence of a large milk surplus they would take steps to extend still further the provision already made to supply liquid milk to school-children and to initiate a scheme on similar lines for expectant and nursing mothers and for children under 5. He took his stand largely on the new standard by which to judge nutrition taken by Sir John Orr in his report entitled "Food, Health and Income." There was, he said, plenty of milk available. He would ask the Government the question which had been recently asked in the *Times*: "Why should not some of the milk now poured into factories be poured down human throats?" Against any additional expenditure which might be entailed they must set the saving there would be in respect of hospitals and medical services. In the long run he believed the nation would save rather than lose.

The Earl of RADNOR asked the Government whether they were proposing to take steps to bring the needs of agriculture and the needs of the nation so far as nutrition was concerned more into line. They knew for certain that it was fresh food that the people needed to bring their nutrition up to standard and it was in this country that fresh food could be produced satisfactorily. There was a very wide gap to-day between the price that the producer got and the price the consumer paid. He did not know whether any Government would ever have the courage to have a searching inquiry into the costs of distribution.

Viscount ASTOR spoke of the report, probably the most important of all, of an international commission of experts which had met in London. Being a report of experts it had been ignored by most people. These international experts were unanimous in saying that there was a real problem of malnutrition and that milk was one of the most important diets that should be dealt with. At the Assembly of the League of Nations last September three days were devoted to the discussion of this subject, after which the Assembly passed unanimously a resolution indicating that there ought to be a comprehensive inquiry into (1) nutrition and public health, (2) the repercussions on agriculture and economics of an improved nutrition policy. As a result of that a committee of which he (Lord Astor) was chairman was set up on which sat medical experts, agriculturists, economists, and others. The committee would present an interim report to the Assembly next September. In their interim report his committee would deal only with the Western World; at some future time they would deal with the Far East, where the problem of malnutrition was far more serious than it was in Europe. They hoped very much that as nutrition improved so cheap foods

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and was appointed anaesthetist and reception officer at Military Hospital No. 1, Canterbury. At the conclusion of hostilities she was decorated by the French Government and continued to take a great interest in the sufferings of the French in the devastated areas. When Canterbury decided to "adopt" the villages of Morval and Lesbœufs Dr. Eleanor Hodson was an energetic worker, while in other philanthropic movements she was a conspicuous figure.

would be allowed to go from countries where they could be produced most cheaply into other countries where from causes of climate or other reasons they could not be produced so cheaply. The price of milk to-day was too high. A great deal could be done to reduce the cost of production. He urged the Government to accept the Bishop of Winchester's proposal. He also hoped that the Government would give a lead in developing a wise nutrition policy.

Lord LUKE said that for the last few months he had had the privilege of serving the Government in their campaign for improving the nutrition of the nation. There had been for several years a Standing Advisory Committee to the Ministry of Health on Nutrition. In 1935 the Government reconstituted the committee with wider terms of reference and Lord Kennet, then Minister of Health, invited him (Lord Luke) to become its chairman. The committee had been asked to find out what food the people of this country were eating and to advise whether it was satisfactory from the health point of view. His committee were fully able to endorse the views now generally held in regard to the consumption of milk. The committee had been able already to produce a report on the nutritive value of milk which had been presented to the Minister of Health and would, he understood, be published very shortly. He hoped that the Government, even if they could not accept the precise terms of the motion, would be able to indicate that they would consider favourably proposals for the increased supply of milk to nursing mothers and children.

THE GOVERNMENT'S REPLY

Viscount GAGE, replying for the Government, said that the problem they had to consider was not whether the people were receiving sufficient food to maintain life, but how far the dietaries of the various classes of the community were adequate to promote and maintain full health. That was a question on which in their present state of knowledge various opinions were no doubt possible. No one would suggest that there was no room for improvement, but they would be viewing this matter in a wholly false light if they did not take into account not merely the high standard of living in this country as compared with other countries, but also the steady improvement which had taken place both in the standards of nutrition and in public health. Some striking figures were given in Sir John Orr's book.

These figures showed the increases in the estimated annual consumption per head of certain foodstuffs and indicated the percentage of consumption in 1934 as compared with the period immediately before the war: Fruit, 188 per cent.; potatoes, 101 per cent.; other vegetables, 164 per cent.; butter, 157 per cent.; eggs, 146 per cent.; cheese, 143 per cent.; meat, 106 per cent.; wheat, 93 per cent.

"It will be seen that, with the exception of wheat, flour and potatoes, there has been a substantial increase in the consumption of most of the principal foods since before the War. The largest increases have been in fruit, fresh vegetables, butter and eggs. In each case the rate of increase has been greater since 1924-28 than in the previous fifteen years.

"These increases in consumption of animal fat, and of fruit and fresh vegetables, are increases in foods of high biological value."

Notwithstanding the industrial depression there had been no halt in the improvement of public health, and for this the health services could claim their share of credit. Of course, it could not be assumed that in all parts of the country and in regard to every class of the community these average figures would apply equally. Nevertheless it could be hardly disputed that the recent social history of this country revealed rising standards of living, improving

standards of nutrition, and better health accompanied by a remarkable increase in the length of life.

USE OF SURPLUS FOODSTUFFS

The problem to which much attention had been given was that of discovering means to make better use of surplus foodstuffs of high nutritional value in the interests both of public health and the agricultural industry. The problem had been termed one of the marriage of health and agriculture. No doubt the increase which they all desired to see in the consumption of these health-giving substances could readily be attained by drastic reductions in price, but a marriage arranged on these terms might well be a marriage of convenience to health, but it would not be particularly welcome to agriculture. But the Government were fully alive to the supreme importance of nutrition to health and had been giving, with the assistance of the Advisory Committee, very close attention to the newly acquired knowledge on the subject. Fortunately, as the Medical Research Council had pointed out, the essential teachings of modern science could be reduced to a few simple statements:—

“On the dietary side, the broad requirements can be simply stated to the public by saying that much more milk (‘safe’ milk), cheese, butter, eggs (especially egg-yolk), and vegetables (especially green vegetables) ought to be consumed. In particular, milk ought to be the chief drink for children, and especially in the first years, while bread and other cereals should in these early years be greatly reduced.”

THE PRESENT CONSUMPTION OF MILK

It was clear, said Lord Gage, that of all food-stuffs milk was from the nutritional point of view by far the most important. Milk was almost a perfect food. Yet the consumption of liquid milk in this country was abnormally low. It averaged about 3 pints per head per week as compared with 5½ in the United States. He thought they might be assured of the value of the schemes already in existence.

Under the milk-in-schools scheme, which covered all children in grant-earning schools and also adolescents attending junior instruction centres aided by the Ministry of Labour, 22,750,000 gallons were consumed during the first year, on which grant amounting to £401,000 was paid. The number of children participating in the scheme had varied monthly between 2,250,000 and nearly 2,900,000. In recent months the number had averaged about 2,600,000. The Milk (Extension of Temporary Provisions) Bill, which had recently passed through Parliament, would enable the milk-in-schools scheme to be continued for a further 12 months until the end of September, 1937. The Education Act, 1921, enabled local education authorities to provide free meals, including milk, for children who needed this help to enable them to take full advantage of the education provided for them. Children obtaining milk in this manner often received two-thirds of a pint or one pint per day. Since that scheme began the number of children in public elementary schools in England and Wales receiving free milk had risen from 100,000 to 275,000. Finally, under the Maternity and Child Welfare Act, 1918, local authorities in England and Wales were empowered to provide free or cheap milk for expectant and nursing mothers and children under 5 years of age. The provision of free milk under these arrangements depended on the recommendation of the medical officer and the inability of the recipient to pay for the milk. Practically all the 422 maternity and child welfare authorities provided some free milk, or at less than cost. About half the milk supplied was in the form of dried milk. Full information as to the annual consumption of milk under maternity and child welfare schemes was not available, but it had been roughly estimated to be equivalent to 7,000,000 gallons—3,500,000 gallons of liquid milk and 5,000,000 lb. of dried milk.

The Ministers of Health and Agriculture had for some time been examining the possibility of a further

extension and encouragement of these milk schemes. The question of consumption was at present under the examination of the Milk Reorganisation Commission, and it would be premature to introduce any new scheme for the provision of milk until the Commission's report had been received.

Workmen's Compensation for Injuries

In the House of Commons on March 20th Mr. MAINWARING moved the second reading of the Employers' Liability Bill. He said that it sought to amend the law in respect of the liability of employers to their workmen for injuries caused to them by the negligence of a fellow workman, and to attach responsibility for such injuries directly to the employer. The Bill was designed to remove an anomaly in the law, the doctrine of common employment, which had been in existence in this country for practically a century. This country alone of the great industrial nations had such a law in operation. An employer was deemed to be responsible for injuries caused in any circumstances by one of his employees to anybody other than his own servants. If an accident resulted in injury to anybody who had common employment in the undertaking then the employer was not responsible.

Mr. A. HENDERSON seconded the motion for the second reading. He said that they were not asking that the workman should be placed in a favoured position, but that he should receive equality of treatment with any other member of the community who was injured as the result of the negligence of another person.

Sir J. WARDLAW MILNE moved the rejection of the Bill. He said that insurance against an indefinite risk of this kind would have to be effected at a high rate. If the Bill became law the temptation to try to prove negligence on the part of a fellow workman would be irresistible, and whereas now much of the compensation paid out was paid without recourse to the Courts, in future there might be protracted cases in the High Court and that would not be for the benefit of the workmen of this country.

Sir D. SOMERVELL, Attorney General, said that the doctrine of common employment was part of the common law of the country. The Bill proposed to alter part of that law. The important point in considering this Bill was that Parliament had affirmed the principle that compensation should be awarded irrespective of negligence. The Bill sought to make the measure of compensation dependent on the proof of negligence. Even assuming that industry could bear this change without detriment to itself, this was, on the whole, a bad use for the money. The effect of the Bill would be in many cases to put a working man in the difficult position of having to make up his mind whether he would risk an action for negligence.

The Bill was rejected by 146 votes to 85.

Midwives Bill

In the House of Commons on March 18th Sir KINGSLEY WOOD, Minister of Health, introduced the Midwives Bill, which was read a first time. An explanatory and financial memorandum, which is prefaced to the Bill, states that the main purpose of the measure is to improve the standard of domiciliary midwifery in England and Wales by establishing an adequate service of salaried midwives. Certain local authorities already exercise to some extent their powers in regard to midwifery under the Maternity and Child Welfare Act, 1918, either by subsidising the midwifery work of local nursing associations or by themselves employing midwives. The present Bill places an obligation on each local supervising authority to secure an adequate service within its area, provides for an Exchequer grant towards the cost of the new service, and deals with other related matters.

Under *Clause 1* it will be the duty of every local supervising authority to secure, whether by making arrange-

ments with welfare councils or voluntary organisations for the employment of midwives as whole-time servants or by itself employing midwives, that an adequate number of salaried midwives is available in its area to attend on women in their own homes as midwives or maternity nurses: the clause provides for the submission to the Minister of proposals for carrying out this duty after consultation with the local bodies concerned.

Clause 2 provides for the advertisement by each authority of the terms of employment in the new service, which is to be on a whole-time basis, and for certain superannuation matters in relation to midwives so employed.

Under *Clause 3* of the Bill authorities will be required to fix scales of fees for the services of their midwives, when acting as such or as maternity nurses, and to recover in each case the appropriate fee, or, if the financial circumstances of the patient do not permit of the payment of the whole charge, such part, if any, as she or the person legally liable to maintain her can afford.

Clause 4 sets out the provisions governing the grants which it is proposed shall be made by the Exchequer towards the cost of the new service. The grants will range from about 85 per cent. of the additional expenditure in the case of the poorest areas to about 20 per cent. in the case of the richest areas, and will amount in all to about half the cost in each year of the new service.

Clause 5 of the Bill provides that a midwife who is not appointed by an authority as a salaried midwife and who agrees to cease practice and to surrender her certificate shall receive compensation based on her emoluments for the last three years, and that any midwife who is required to surrender her certificate by reason of age or infirmity shall receive compensation based on her emoluments for the last five years.

The remaining clauses contain provisions for preventing unqualified persons from practising as nurses in maternity cases, for securing the periodical attendance of certified midwives at courses of instruction to be provided by authorities, and for enabling authorities to defray certain expenses incurred by them under previous Midwives Acts.

In the House of Lords on Tuesday, March 24th, Viscount GAGE introduced a Bill to consolidate and amend certain enactments relating to public health. The Bill was read a first time.

HOUSE OF COMMONS

WEDNESDAY, MARCH 18TH

Quality of Margarine Supplied in Royal Air Force

Mr. LEACH asked the Under-Secretary of State for Air if the low-priced and inferior quality of margarine supplied to the Air Force was of the type to which vitamins A and D had been artificially added or was it of the non-vitamin containing variety.—Sir P. SASSOON replied: The margarine supplied to apprentices and boys in the Royal Air Force is vitaminised, but not that supplied to airmen.

Mr. LEACH: Can the right hon. gentleman say whether the insertion of these vitamins in margarine can actually be performed with success; and does he know that butter contains both these vitamins?

Sir P. SASSOON: I believe medical authorities consider that vitaminised margarine is equal if not superior to butter because the vitamin content of butter varies according to the seasons of the year.

Gastric Disorders Among Omnibus Men

Mr. SHORT asked the Lord President of the Council if he would say what progress the Industrial Health Research Board of the Medical Research Council had made respecting the investigation of the cause of gastric disorders among omnibus men.—Capt. MARGESSON (Parliamentary Secretary to the Treasury) replied: I am informed that the investigation is being actively pursued, but that it has only recently begun and is still in an early stage. It will necessarily take some time to collect reliable statistics to show whether an excessive incidence of gastric

disease is, in fact, associated with this occupation. If an affirmative answer is obtained it is proposed to extend the inquiry to a study of possible causes.

Temperature and Humidity Conditions in Hospitals and Schools

Mr. MARKHAM asked the Minister of Health whether any inquiry was proceeding in this country at the moment into the question of temperature and humidity conditions in schools, hospitals, &c.; and, if not, whether he would take steps to institute such inquiries.—Sir KINGSLEY WOOD replied: I understand that inquiries relating to questions of warmth and comfort in buildings are being carried out by an inter-departmental committee of the Medical Research Council and the Department of Scientific and Industrial Research, and that a further report will shortly be issued by the Council. In these circumstances I do not at present think it necessary to institute further inquiries with special reference to schools or hospitals.

THURSDAY, MARCH 19TH

Medical Treatment in Training Centres

Miss WARD asked the Minister of Labour if he could yet inform the House what steps he proposed to take to provide medical treatment for young men.—Lieut.-Colonel MUIRHEAD (Parliamentary Secretary to the Ministry of Labour) replied: Arrangements are being made to provide treatment in appropriate cases for young men in the special areas of the ages of 18-24 inclusive who are willing to attend a training centre, but who are at the moment prevented from doing so by reason of remediable defects.

Miss WARD: Can my hon. friend say what the arrangements are?

Lieut.-Colonel MUIRHEAD: The arrangements are being undertaken, but they are not yet completed. I cannot give any date for their completion, but they are being pressed on as quickly as possible.

Instruction on the Dangers of Alcohol

Mr. PALING asked the President of the Board of Education whether any steps had been taken by the Board to carry out the recommendation of the Royal Commission on Licensing, paragraph 699, that His Majesty's inspectors should inquire as to the extent to which instruction on the dangers of alcohol was carried out in the schools they visited; and if he could present any return or report showing the results of the inquiries made.—Mr. OLIVER STANLEY replied: The Board's "Handbook of Suggestions on Health Education" contains a chapter on the hygiene of food and drink, which was revised after the publication of the report of the Royal Commission on Licensing, and the Board consider that a knowledge of its contents should be regarded as part of the necessary equipment of every teacher. H.M. inspectors have been instructed to pay particular attention to, and to report on, the health instruction given in schools, but I am unable to furnish a report such as the hon. Member desires.

Special Schools for Mentally Defective Children

Sir FRANCIS FREMANTLE asked the President of the Board of Education if he would say for how many children accommodation was available in special schools for mentally defective children; and for how many accommodation was available 25 years ago.—Mr. OLIVER STANLEY replied: There is accommodation available in special schools for 16,562 mentally defective children as compared with accommodation available in 1911 for 11,854.

Sir F. FREMANTLE: Does the right hon. gentleman think that is satisfactory progress considering the importance of the problem?

Mr. OLIVER STANLEY: In a recent circular I issued I pointed out that there was a need for better residential accommodation for these children in certain areas, and I urged local authorities to make progress in the matter.

Sir FRANCIS FREMANTLE asked the President of the Board of Education if he would arrange for the notification of defective children on leaving school to the mental deficiency authority.—Mr. OLIVER STANLEY replied: Provision is made in Article 4 of the Mental Deficiency

(Notification of Children) Regulations for the notification of mentally defective children due to leave special schools on or before attaining the age of 16. There is no power whereby local education authorities can notify children leaving other schools, but the Board have suggested that such children could be informally brought to the notice of the mental deficiency authorities for friendly supervision on a voluntary basis.

Sir F. FREMANTLE: Is the right hon. gentleman looking after this to see if it is carried out properly because the information generally is that it is not carried out?

Mr. OLIVER STANLEY: The whole question of closer co-operation is now under consideration by the local authorities.

Small Traders and National Health Insurance

Mr. ARTHUR HENDERSON asked the Minister of Health whether he proposed to introduce legislation to allow shopkeepers to become voluntary contributors under the National Health Insurance Acts for the purpose of qualifying for the receipt of benefits, including medical, sickness, and disablement benefits.—Sir KINGSLEY WOOD replied: The answer is in the negative. The new scheme which the Government has announced its intention of introducing will be limited to pensions insurance. The Government feel that the success of the new scheme would be jeopardised by the inclusion of health insurance, because the contribution required to provide the combined benefits would be so substantial as to make the scheme unacceptable to many persons who are anxious to secure the pensions benefits. I would remind the hon. Member that under the National Insurance Act, 1911, shopkeepers and other persons working on their own account had the opportunity of becoming voluntary contributors for health insurance purposes, but the option was withdrawn by the Act of 1918 because of the meagre response to the offer.

Spahlinger Treatment for Tuberculosis

Sir FRANCIS FREMANTLE asked the Minister of Agriculture if adequate experiments were being made in this country to check those in Northern Ireland on the Spahlinger vaccine for the prevention of tuberculosis in cattle; how long these experiments would take; and whether, if it be proved successful, he would take steps to secure its general adoption.—Mr. ELLIOT replied: I am in close touch with the work that has been and is being carried out in Northern Ireland in connexion with the Spahlinger vaccine. The question of conducting tests with the vaccine in this country is under consideration. I am, however, not yet in a position to make a statement as to the scope or duration of any experimental work which may be undertaken.

MONDAY, MARCH 23RD

Small-pox in India

Mr. LEACH asked the Under-Secretary of State for India whether he had received any information with regard to small-pox outbreaks in India; and whether the outbreaks this year had been heavier than usual at this period.—Mr. BUTLER replied: There has recently been an acute epidemic of small-pox in Bengal. Complete up-to-date figures for the Province as a whole are not yet available, but in Calcutta 1558 deaths from small-pox have occurred this year up to March 7th. This is greater than the average of recent years, but the disease comes in waves at irregular intervals.

TUESDAY, MARCH 24TH

Cerebro-spinal Fever in Army Camps

Mr. DAY asked the Secretary of State for War to state the number of cases of cerebro-spinal fever reported and admitted to hospital at Aldershot and/or Catterick during the previous 12 months; and whether there had been any reports from other camps in Great Britain.—Mr. DUFF COOPER replied: The number of cases of cerebro-spinal fever for 1935 were: Aldershot, 7; Catterick, 2. In addition there were 14 cases from various stations throughout Great Britain, making a total of 23. The number of cases from Jan. 1st, 1936, to date are: Aldershot, 1;

Catterick, 4. In addition there were 7 cases at Woolwich, 2 at Chatham, and 1 at Windsor, making a total of 15.

Puerperal Fever in Derbyshire

Mr. HOLLAND asked the Minister of Health how many cases of puerperal fever had occurred in Derbyshire during the past three months; how many of such cases originated in maternity institutions; whether the source of the infection had been traced; and with what results.—Mr. SHAKESPEARE (Parliamentary Secretary to the Ministry of Health) replied: Thirteen cases of puerperal fever were notified in Derbyshire during the 13 weeks ended March 14th. One case occurred in one of the maternity institutions which are provided or subsidised by local authorities and which are, therefore, required to report to my right hon. friend. There were also 11 cases of the condition known as puerperal pyrexia in the same institution during that period. Investigation showed that the source of infection could probably be traced to a throat infection in a member of the staff, and the institution was temporarily closed and the premises disinfected.

MEDICAL SICKNESS, ANNUITY AND LIFE ASSURANCE SOCIETY

The annual report announces that 1936 is a bonus year for members of this society, which is the only insurance company paying a reversionary bonus on its sickness and accident policies as well as on its life policies. The surplus available for distribution depends on the profits of the sickness fund and therefore varies according to the society's experience; in 1932, for example, the bonus was 12s. for each guinea per week insured on each premium paid in the preceding five years, while in 1927 the figure was 15s. per guinea. The directors take an optimistic view of the prospects for 1936, as the present experience seems to be favourable. Prospective members of the society are advised that it is open only to the medical and dental professions; that it is conducted on a "mutual profit" basis; that, if desired, combined policies are issued embodying both life and sickness assurance; that loans for the purchase of practices and house property are offered; and that pension policies are available for insurance practitioners and members of the British Medical Association. In presenting the report of the 51st year of the society the directors speak of continued expansion. The total funds have increased by £147,526 to £1,239,639. The premium income of the life assurance fund amounted to £101,268, and the rate of interest earned on this fund was £4 6s. 3d. per cent. after deduction of tax. The new annual premiums again reached a record figure, amounting to £10,071; the payments for sickness claims increased slightly to £53,494. The total premium income increased to £202,460, and the expenses of administration were reduced by 1.8 per cent. of last year's figures to £19,685; this is 9.7 per cent. of the total premium income. The growth of the society in the last few years has made it necessary to secure larger offices; fortunately it was possible to find the accommodation in the same building in which the society has had its offices since 1914, at 300, High Holborn, London, W.C.1.

RHEUMATIC CLINIC FOR ABERDEEN.—The provision of a clinic for the treatment of rheumatic diseases at Aberdeen is being considered. It is thought the Royal Infirmary buildings at Woolmanhill which will shortly become vacant might be reconstructed for this purpose.

CARDIFF ROYAL INFIRMARY.—There has been a gradual increase in expenditure at this hospital amounting to between £4000 and £5000 a year, and as there is no prospect of reduction, a regular additional income of £5000 a year must be obtained. The chairman of the finance committee has suggested that the weekly contributions from workmen should be raised from 2d. to 3d. a week.

MEDICAL NEWS

University of Oxford

On May 5th in convocation it will be proposed to confer the honorary degree of D.Sc. on Sir Cuthbert Wallace, P.R.C.S., Sir Walter Langdon-Brown, Dr. Robert Hutchison, Prof. Charles Singer, Sir Henry Dale, F.R.S., and Sir George Newman. The degrees will probably be conferred when the British Medical Association meets at Oxford this summer.

A Radcliffe travelling fellowship has been awarded to Dr. A. P. Meiklejohn, Robinson senior scholar of Oriol College.

University of Liverpool

At recent examinations the following candidates were successful:—

Part I.—J. D. Bryan, W. N. M. Mason, T. H. Pierce, F. Pygott, H. R. Shone, Edna L. Smart, B. A. Taylor, Mary M. Thomson, and T. P. Twomey.

D.P.H.
W. Barnetson, A. Boules, D. L. Cran, N. G. Gandhi, R. G. Ghoshal, A. G. Hiremth, M. T. Ismail, B. B. Mukerjee, W. Murray, M. S. Rao, and J. G. Silmon.

D.T.H.
W. Crawford, K. O'Toole, S. K. Ting, and T. P. Tu.
Dr. R. G. Ghoshal has been recommended for the Milne medal.

University of Leeds

Mr. J. C. Gillies has been appointed honorary demonstrator in anatomy, and Mr. D. J. Cork lecturer in dental pathology and bacteriology.

At recent examinations the following candidates were successful:—

M.D.
Bessie Brown and W. H. Tod.
CH.M.
P. R. Allison.

FINAL EXAMINATION FOR M.B., CH.B.

Part I.—N. Baster, Joan M. Bateson, G. R. Bedford, Rosemarie Blackwood, H. Cohen, A. A. Driver, R. W. Ellis, K. M. Fox, V. P. Geoghegan, I. R. Gray, G. W. Green, G. W. V. Greig, T. Hardy, Gwyneth M. Hosking, S. Lask, R. F. Lawrence, S. Levy, N. Livingstone, Agnes M. Mitchell, R. B. Raj, F. P. Raper, J. A. Rhind, A. H. Rhodes, Joyce M. Rhodes, Phyllis M. Richards, I. D. Riley, G. B. Robinson, H. Silverman, C. L. Summerfield, J. C. T. Sykes, D. Taverner, H. Thistlethwaite, L. G. Topham, Mary Townsend, Lella M. Wainman, J. W. Walker, F. J. D. Webster, and F. W. Wigglesworth.

Part II.—G. N. Blackburn, Olive M. Callow, Marie H. Calverley, G. Clarke, J. C. Coates, W. Davidson, W. G. France, W. Hobson, J. Holden, R. L. Lamming, D. M. Leiberman, S. Mattison, W. S. A. Oakes, G. Quayle, O. Scarborough, J. P. Senior, Winnie Shaw, C. E. Stuart, E. H. Tomlin, C. W. Ward, and H. L. L. Wilson.

Part III.—R. L. Lamming (with first class honours); J. C. Coates and W. Hobson (with second class honours); G. N. Blackburn, Olive M. Callow, Marie H. Calverley, G. Clarke, W. Davidson, W. G. France, J. Holden, D. M. Leiberman, S. Mattison, W. S. A. Oakes, G. Quayle, O. Scarborough, Winnie Shaw, C. E. Stuart, E. H. Tomlin, C. W. Ward, and H. L. L. Wilson.

FINAL EXAMINATION FOR L.D.S.

H. C. Brewerton, O. B. Clarke, T. W. Frost, and W. Pickup.
D.P.M.
A. D. D. Broughton and E. Smith.
D.P.H.
J. C. G. Anderton, E. L. Brittain, and J. W. Whitworth.

University of Manchester

Mr. John Morley, lecturer in systematic surgery in the University, has been appointed to the chair of surgery in succession to Prof. E. D. Telford who will retire in June.

Mr. Morley, on leaving Bishop Stortford College, entered the University of Manchester and graduated M.B. with first-class honours in 1908. He obtained the degree of Ch.M. in 1911 and became F.R.C.S. Eng. in the same year. During his course he gained many awards, including the graduate scholarship in medicine, the Bradley scholarship in clinical surgery, the Tom Jones exhibition in anatomy and the Tom Jones surgical scholarship, and the Ashby research scholarship in the diseases of children. He held a demonstratorship in anatomy in the University from 1910 to 1911 and was lecturer in clinical anatomy from 1912 to 1920 when he was appointed a lecturer in applied anatomy. This appointment continued until, in 1930, he took up his present position. During the war he held the rank of captain in the R.A.M.C. (T.F.), and was awarded the Croix de Chevalier of the Legion of Honour for services in Gallipoli. Mr. Morley is consulting surgeon to Ancoats Hospital, assistant surgeon to the Manchester Royal Infirmary, and a consulting surgeon for children to St. Mary's Hospitals, Manchester. His best known work is his book on "Abdominal Pain," published in 1931.

University of Sheffield

At recent examinations the following candidates were successful:—

P. B. L. Potter. *M.D.*

FINAL EXAMINATION FOR M.B., CH.B.

Parts II. and III.—R. T. Gaunt, J. R. Grimoldby (with second class honours); E. D. Belbin, H. A. Cole, J. L. Dales, P. M. Iman, S. Miles, E. L. M. Millar, and Cyril South.

Scholarships for Sons of Medical Men

Sir Milsom Rees scholarships of £100 each to Port Regis Preparatory School, Broadstairs, have been awarded to E. H. B. Smith, son of Major E. C. A. Smith, I.M.S., and to J. M. H. Dickson, son of Dr. W. S. Dickson.

Medical Art Society

The second exhibition of this society, which was founded last year, will be held in July. It is proposed that the members dine together before visiting the exhibition. A certain number of frames of stock sizes will be available for the exhibits of country members. Further information may be had from the hon. secretary, Prof. C. A. Pannett, St. Mary's Hospital, London, W.2. The president is Sir Leonard Hill, F.R.S.

General Medical Council

At the meeting of the executive committee held on Feb. 24th it was announced that the following names erased from the Medical Register under Section 14 of the Medical Act, 1858, had now been restored:

Bennett, Thomas	Kinnear, Joseph
Browne, Patrick F.	Mackenzie, Andrew H.
Fraser, Patrick	Murphy, John K.
Horsley, Lancelot	O'Brien, Catherine M.
Jones, Lewis	Weston, Alfred W.

A reported amendment of the 1928 Act in the Union of South Africa enables holders of New Zealand medical degrees to be registered in the Union, and revokes the right of holders of the M.D. of Royal Universities of Italy. A new regulation by the Saudi Government forbids any doctor, dentist, veterinary surgeon, dental operator, or accoucheuse to practise in the Kingdom of Saudi unless registered under specific conditions by the public health department.

National Ophthalmic Treatment Board

This board has completed a film called "Do You See?" which illustrates in story form the need of watchfulness against eyestrain, and emphasises the danger of receiving eye treatment from anyone but a qualified eye specialist. One sequence of the film deals with the history of spectacles and another shows the activities of the National Eye Service centres which the Board has established in cooperation with the British Medical Association. These centres provide for examination of the eyes of persons of limited means by medical eye specialists at a nominal fee. The address of the Board is 1, High-street, Marylebone, W.1.

The Grenfell Association

Dr. H. L. Paddon gave an address, entitled Twenty-one Years with Sir Wilfrid Grenfell in Labrador, at a meeting on March 18th of the Grenfell Association of Great Britain and Ireland, at which Lord Horder presided. He said that Grenfell found pathetic relics of two races, Eskimos and Indians, which were suffering grievously from contact with white men. He described the havoc played by epidemics of small-pox, influenza, scarlet fever, and measles. The tragedy of the native races could not be stayed, but there still remained the white settlers and mixed stock, and Labrador could be made an industrial asset of the Empire, though the country's resources were still undeveloped. Tuberculosis and nutritional disease were disappearing in the districts round the hospitals and medical centres. Lord Horder said there was no form of human activity for which he would like to appeal more strongly than for the Grenfell Association. Mr. Vincent Massey, High Commissioner for Canada, ascribed to Grenfell the honour of having removed the reproach often applied to Labrador "The land that God gave Cain."

Grading of Milk

Sir Kingsley Wood, the Minister of Health, having considered representations made to him upon the Draft Milk (Special Designations) Order, 1936, has decided to make some modifications in the Order and to postpone the date of operation till June 1st.

Laryngo-phoniatry

Ten lectures on this subject will be given from May 11th to 16th at the Hôpital Bellan, 7, rue du Texel, Paris XIV. Further information may be had from Dr. Jean Tarneaud, 27, Avenue de la Grande Armée, Paris XVI.

London Hospital

Sir William Goschen, chairman of this hospital, announces that of the £80,000 required for extensions only £13,674 has so far been subscribed. It is becoming increasingly difficult to carry on the work of the institution, and as a result of lean and difficult years in the past the loan account stands at £81,000.

Royal Waterloo Hospital, London

This hospital's income last year rose from £24,005 to £24,997, but the weekly cost of each in-patient also rose, from £3 8s. 3½d. to £3 10s. 10½d. The out-patient department is very much congested and it has become necessary to extend the building.

Westminster Hospital

At the end of 1935 over £178,000 had been given or promised to the rebuilding fund of this hospital, and during the last three months promises of sums amounting to a further £12,500 have been received. The sum of £25,000 is needed before the new medical school building, which is badly needed, can be completed.

Clinic for Endocrine Disorders

A new out-patient department for the treatment of endocrine disorders is to be opened at Guy's Hospital, London. It will be regarded purely as a reference department, and for the present there will be only one session weekly. Dr. P. M. F. Bishop, as honorary clinical endocrinologist, will be in charge of the clinic.

Harvey's Statue at Folkestone

On Wednesday next, being the anniversary of his birth in Folkestone, the statue of William Harvey on the Leas will be unveiled in a form more worthy of his birth-place. The statue, 30 ft. in height, cast in bronze, on a granite plinth and pedestal, has been decolorised since its erection in 1881 by the salt air to a mottled green. The inscription on the base, which has long been hardly discernible, is being renovated for all who will to read:—

WILLIAM HARVEY.

The Discoverer of the Circulation of the Blood.

Born in Folkestone April 1, 1578.

Died in London June 3, 1657.

Buried at Hempstead, Essex.

Harvey's memory is also recalled in Folkestone by the stained-glass window in the parish church, and by the grammar school founded by one of his relations.

Congress on Hepatic Insufficiency

An International Congress on Hepatic Insufficiency will be held at Vichy from Sept. 16th to 18th immediately after the International Congress on Gastroenterology which is taking place in Paris from Sept. 13th to 15th. The congress at Vichy will meet under the presidency of Prof. Maurice Loeper (Paris), and the subjects for discussion have been arranged in two sections. Prof. Noel Fiessinger (Paris) will preside over the medicine and biology section, and among those who will contribute to the discussions are Dr. R. Debré, Dr. Gilbrin, Dr. Seme-laigne, Prof. Binet, and Prof. Lemaire (Paris), Dr. Olmer (Marseilles), Dr. Erich Urbach (Vienna), Dr. A. Parhon (Bucharest), and Dr. Hamilton Fairley (London). Prof. Mauriac (Bordeaux) is to preside over the therapy section, and the speakers will include Prof. Brulé, Prof. M. Villaret, Prof. L. Justin-Besançon, Dr. R. Cachera, and Dr. R. Fauvert (Paris), Prof. Piery and Dr. Milhaud (Lyons), Dr. De Grailly (Bordeaux), Dr. F. Gallart-Mones (Barcelona), Prof. B. Pribram (Berlin), Prof. P. Duval, Dr. J. C. Roux, and Dr. Goiffon (Paris). Dr. J. Aimard is the general secretary of the congress and may be addressed at 24 Boulevard des Capucines, Paris, IX^e.

Princess Alice Hospital, Eastbourne

The Marchioness of Hartington opened the nurses' home extension at this hospital on March 23rd.

London Homœopathic Hospital

It is proposed to provide an enlarged casualty department at this hospital for the reception and treatment of the increasing number of accident and ambulance cases.

Birmingham Children's Hospital

A babies' block is to be erected at this hospital and a public appeal made to pay for the building and equipment. Mr. Peter Bennett has promised to give £10,000 under a seven years' deed of covenant.

Research Fellowship in Medicine

The Council of the Royal Society invite applications for the E. Alan Johnston and Lawrence research fellowship in medicine which is tenable in any hospital or medical school in the British Isles. The fellow is elected for two years and receives an annual stipend of £700. Particulars will be found in our advertisement columns.

Bath Mineral Water Hospital

Mr. Sidney Robinson has offered £35,000 for the building of the projected new hospital on a site which has already been cleared. Last year he gave £5000 to meet the cost of the additional nurses' quarters, and his earlier gifts include £3000 for the erection of a new ward and £1500 to facilitate the organisation of a national research laboratory. Mr. Robinson makes his offer on the condition that building shall begin within two years.

Incorporated Society of Chiropodists

The annual dinner of the society was held on Saturday evening last at the Trocadero, the president of the society, Mr. John H. Hanby, welcoming at the reception over 200 members and their guests. The toast of the evening was proposed by Mr. Norman Lake, senior surgeon to Charing Cross Hospital, who told the story of the early struggles of the society, to which the chairman replied, recalling the steady and practical advance of recent activities, and dwelling on the good work done at the Foot Hospital. The toast of the medical profession was proposed by Sir Henry McMahon and acknowledged by Mr. W. H. Ogilvie and Dr. A. W. Oxford. Thereafter a large number of the company danced.

St. Mark's Hospital, London

The annual general meeting of the governors of this hospital was held on March 19th. Sir Percy Vincent, the Lord Mayor, presided, and, in proposing the adoption of the report of the committee of management, said that 1935, the centenary year of the hospital, had been one of great activity in all departments. The number of patients admitted to the wards had been 1129, which was the highest recorded. The income had exceeded the expenditure, but the surplus was accounted for by legacies, which could not be regarded as normal income. After a hundred years of humanitarian work in the City of London St. Mark's needed £60,000 to meet its increased responsibilities. An appeal for that sum had been launched in 1934, and £8745 had been received in response. It was proposed to build a modern nurses' home, to increase the bed complement, to provide a self-contained paying patients' block, to install a second operating theatre, and to improve the cancer research, X ray, and out-patient departments. The hospital records showed the importance of early treatment, but, owing to lack of accommodation, hundreds of cases had to be turned away, with disastrous results. The need had become so urgent that plans were on foot to begin work on the extensions, and it was hoped that the foundation-stone of the new nurses' home would be laid during the present year. The hospital was doing a noble and useful work, and he hoped it would receive the support from the public which it undoubtedly deserved.

Mr. Lionel Norbury, the senior honorary surgeon of the hospital, said that there were 201 people on the waiting-list at the present moment, and the number seldom fell below that. A considerable proportion of those 201 people were cancer patients, for whom early treatment was of the utmost importance, and it was therefore imperative that the size of the hospital should be increased at the earliest possible moment.

Medical Diary

SOCIETIES

- ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.**
WEDNESDAY, April 1st.
History of Medicine. 5 P.M. Mr. F. N. Doubleday : John Keats, Poet and Doctor.
Surgery. 2 P.M. (King's College Hospital, Denmark Hill, S.E.). Operations by Mr. C. P. G. Wakeley, Mr. J. Everidge, and Mr. H. C. Edwards. Cases will be shown, and there will be a Demonstration of Microscopic Sections, including Adenolymphomata of the Salivary Glands. 4.30 P.M., Dr. R. D. Lawrence: Sugar Metabolism in Hyperthyroidism. Mr. H. C. Edwards: The Value and Technique of Gastroscopy. Dr. R. A. McCance: Sodium Deficiency in Surgical Practice.
- WEST LONDON MEDICO-CHIRURGICAL SOCIETY.**
FRIDAY, April 3rd.—8.30 P.M. (De Vere Hotel, Kensington), Prof. Hey Groves and Mr. Sangster Simmons: Treatment of Fractures.
- WEST KENT MEDICO-CHIRURGICAL SOCIETY.**
FRIDAY, April 3rd.—8.45 P.M. (Miller General Hospital, Greenwich). Dr. F. Hudson Evans, Dr. L. W. Bain, Dr. Edward Glover, and Dr. S. S. Lindsay: That the Neurotic Patient should be Treated by His Own Family Doctor.
- HARVEIAN SOCIETY.**
THURSDAY, April 2nd.—8.30 P.M. (Manson House, 26, Portland-place, W.), Dr. W. E. Chiesman and Dr. G. de Bec Turtle: Hematemesis.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

- UNIVERSITY OF BIRMINGHAM.**
TUESDAY, March 31st.—3.30 P.M. (General Hospital), Dr. B. C. Tate: Demonstration of Skin Diseases.
FRIDAY, April 3rd (Queen's Hospital), Prof. W. Gemmill: Demonstration of Surgical Cases.
- ROYAL INSTITUTION, 21, Albemarle-street, W.**
TUESDAY, March 31st.—5.15 P.M., Prof. Edward Mellanby, F.R.S.: Drug-like Actions of Some Foods.
- INSTITUTE OF HYGIENE, 28, Portland-place, W.**
WEDNESDAY, April 1st.—3.30 P.M., Dr. R. Fortescue Fox: Arthritis in Women.
- CHADWICK LECTURE.**
THURSDAY, April 2nd.—8.15 P.M. (Royal Institute of British Architects, 68, Portland-place, W.), Mr. Lionel Pearson: Modern Hospital Construction.
- BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.**
MONDAY, March 30th.—11.30 A.M., Prof. F. R. Fraser: Tuberculosis Complicating Pregnancy.
TUESDAY.—2.30 P.M., Dr. King: Hepatic Function and Jaundice.
WEDNESDAY, April 1st.—Noon, Clinical and pathological conference (medical). 2.30 P.M., Clinical and pathological conference (surgical). 3.30 P.M., Mr. Aleck Bourne: Disproportion and Difficult Labour.
THURSDAY.—2.15 P.M., Dr. Duncan White: Radiological Demonstration. 3 P.M., Dr. Chassar Moir: Operative Obstetrics.
FRIDAY.—Noon, Dr. A. A. Davis: Gynaecological Pathology. 3 P.M., Dr. Alan Moncrieff: Hygiene of the New-born Child. 5 P.M., Sir James Walton: Surgical Aspects of Dyspepsia.
 Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics or operations, obstetric and gynaecological clinics or operations.
- FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.**
MONDAY, March 30th, to SUNDAY, April 5th.—**INFANTS HOSPITAL, Vincent-square, S.W.** All-day course in infants' diseases. Mon., Wed., and Fri., 8 P.M., primary F.R.C.S. course (anatomy and physiology).—**NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W.** Wed., Dr. Reginald Lightwood: Recent Views on Anæmia in Childhood. Fri., 8.30 P.M., Dr. Lightwood: Rational Prescribing for Children. Sat. and Sun., all-day course in general medicine and surgery.—**WEST END HOSPITAL FOR NERVOUS DISEASES, Gloucester-gate, Regent's Park.** Tues., 8.30 P.M., Fundus Oculi Demonstration by Mr. Lindsay Rea for M.R.C.P. Candidates. Courses are open only to members of the Fellowship.
- HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.**
WEDNESDAY, April 1st.—2 P.M., Dr. Bertram Shires: Radiography of the Chest. 3 P.M., Dr. G. H. Newns: Pulmonary Diseases. Morbid Anatomy Demonstration.
 Out-patient Clinics daily at 10 A.M. and ward visits at 2 P.M.
- NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westminster-street, W.**
TUESDAY, March 31st.—5.30 P.M., Dr. B. T. Parsons-Smith: Oedema and its Treatment.
- MANCHESTER ROYAL INFIRMARY.**
TUESDAY, March 31st.—4.15 P.M., Dr. A. Ramsbottom: The Treatment of Peptic Ulcer with Special Reference to Larostidin.
FRIDAY, April 3rd.—4.15 P.M., Dr. F. R. Ferguson: Demonstration of Neurological Cases.
- ANCOATS HOSPITAL, Manchester.**
THURSDAY, April 2nd.—4.15 P.M., Clinical Meeting.
- GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.**
WEDNESDAY, April 1st.—4.15 P.M. (Royal Samaritan Hospital for Women), Dr. John Gardner: Prolapse.

Appointments

- ALLEN, H. W., D.M. Oxon., D.P.H.,** has been appointed Medical Registrar at the Prince of Wales's General Hospital, London.
- BADENOCH, A. W., M.D. Aberd., F.R.C.S. Eng.,** Surgical Registrar at the Metropolitan Hospital, London.
- BLAND, J. O. W., M.D. Camb.,** Senior Demonstrator of Bacteriology at St. Bartholomew's Hospital, London.
- BOYCOTT, J. A., B.M. Oxon.,** Assistant Bacteriologist to St. George's Hospital, London.
- BREWER, H. F., M.D. Camb.,** Clinical Pathologist to St. Bartholomew's Hospital, London.
- CLARKE, J. H., M.D., D.P.H.,** Medical Officer of Health for the County of Lincoln (Kesteven).
- CRUICKSHANK, ALEXANDER, M.B. Aberd., F.R.C.S. Eng.,** Surgical Registrar at the Prince of Wales's General Hospital, London.
- CUTHERBERT, J. A., M.B. Edin., D.P.H.,** Assistant Medical Officer of Health for Dundee.
- DEVLIN, W. L., M.B. Belf., D.P.H.,** Assistant Medical Officer for Rhondda.
- REBURN, CYRIL, M.R.C.S. Eng.,** Second Assistant Pathologist at the Royal Sussex County Hospital, Brighton.
- ROUGEHEAD, J. A., M.B. Glasg., D.P.H.,** Medical Officer of Health to the Burton Latimer, Desborough, and Rothwell Urban Councils, the Kettering Rural District Council, and Assistant Medical Officer to the Northants County Council.
- TODD, T. F., M.S. Lond., F.R.C.S. Eng., M.C.O.G.,** Hon. Assistant Gynaecologist to the Royal Hospital, Salford.
- WINTERTON, W. R., M.B. Camb., F.R.C.S. Eng., M.C.O.G.,** Assistant Surgeon to the Hospital for Women, Soho-square, London.
- Sheffield Royal Hospital.*—The appointment of the following Clinical Assistants is announced:—
LUDDLAM, G. B., M.B. Edin., D.L.O., Ear, Nose and Throat Department;
FAULKNER, S. H., M.D. Belf., M.R.C.P.I., D.O.M.S., Ophthalmic Department; and
KEMP, F. H., M.B. Birm., X Ray Department.
- Certifying Surgeons under the Factory and Workshop Acts:** Dr. J. T. MOFFAT (Coggeshall District, Essex); Dr. T. H. MCLEOD (North Walsham District, Norfolk).
- Medical Referee under the Workmen's Compensation Act, 1925:** C. W. GRAHAM, M.B., F.R.C.S., of Edinburgh, for all Sheriff Court Districts at present comprised in the Sheriffdoms of Fife and Kinross; the Lothians and Peebles; and Stirling, Dumbarton, and Clackmannan; with a view to his being employed in ophthalmic cases.

Births, Marriages, and Deaths

BIRTHS

- ADAM.**—On March 16th, the wife of Dr. W. Blane Adam, of Crowborough, of a daughter.
- BYROM.**—On March 19th, at Muswell Hill, Kathleen, wife of F. B. Byrom, a daughter.
- CONYERS.**—On March 16th, at Sutherland-avenue, W., the wife of J. H. Conyers, F.R.C.S. Eng., of a son.
- DAVENPORT.**—On March 17th, at Welbeck-street, the wife of Robert Davenport, F.R.C.S. Eng., of twin sons.
- DAVIDSON.**—On March 13th, in London, the wife of Dr. James Davidson, Brampton-grove, N.W., of a daughter.
- DAVIES.**—On March 17th, at Walmer, the wife of Dr. D. A. Davies, of a daughter.
- DAY.**—On March 14th, at Norwich, the wife of Dr. George H. Day, of a son.
- JACKSON.**—On March 19th, to Marjorie (née Kerr), wife of H. B. Jackson, M.B., M.R.C.P. London, of Sheringham—a daughter.
- MARKS.**—On March 20th, the wife of Dudley P. Marks, M.B. Camb., F.R.C.S. Eng., of Stratford-on-Avon, of a daughter.
- PAGAN.**—On March 15th, at Southampton, the wife of Dr. A. T. Pagan, of a son.
- SPICER.**—On March 14th, at Southsea, the wife of Captain W. R. C. Spicer, R.A.M.C., of a son.

MARRIAGES

- KNOX—CRUST.**—On March 21st, at St. Bartholomew the Great, Robert Knox, M.D. Lond., of Cambridge, to Lynda Crust, of Miningsby.

DEATHS

- BOWER.**—On March 19th, at Avenue Mansions, N.W.3, William Bower, M.B. Camb., late of Ware and Hendon.
- DODWELL.**—On March 18th, at Albert Bridge-road, S.W., Philip Rashleigh Dodwell, M.D. Lond., in his 73rd year.
- EAMES.**—On March 13th, at Derby, Ernest Victor Eames, L.R.C.P. Edin., late of Heanor, Derbyshire.
- HANSON.**—On March 21st, in London, in motor-car accident, Dorothy Mable Hanson, M.B. Liverp.
- LOW.**—On March 21st, at Singapore, consequent on a fall, John Meredith Low, M.R.C.S. Eng., Capt., R.A.M.C.
- SHADWELL.**—On March 21st, at Richmond, Arthur Shadwell, M.D. Oxon., F.R.C.P. Lond., aged 81.
- TWEEDIE.**—On March 18th, Alexander Robert Tweedie, F.R.C.S. Eng., late Colonel R.A.M.C., T., ret'd., of Nottingham.
- WHITAKER.**—On March 22nd, suddenly, at Farncombe, Surrey, Sir James Smith Whitaker, M.R.C.S. Eng., late Senior Medical Officer to the Ministry of Health, in his 71st year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

THE ART OF MEDICINE¹

BY CHRISTOPHER HOWARD, M.R.C.S.

EARLY DIAGNOSIS: TREATMENT OF PNEUMONIA

To make an early diagnosis is often to win half the battle in a case of serious illness, for as a rule treatment only fails because it is not administered sufficiently soon. Take, for instance, early pneumonia. In this disease there may be no chest signs to commence with, except widespread pain, but there are, I think, three signs which, if present, enable one to make a definite diagnosis and so to free one's mind of the incubus of the unknown. The first is the working of the nostrils, which is present even when there may be no very obvious respiratory embarrassment; and it is a sign which the best of physicians I have met, the late Dr. Ogle, continually impressed upon his clerks. The second is a pungent burning skin, which is immediately felt by the trained hand, and which may exist in the absence of a very high temperature, and for which I have never heard any adequate physiological explanation. And the third is the complete absence of chlorides from the urine. These three signs form a valuable trinity to remember, for the more one practises physic the greater is the realisation that one physical sign is worth half a dozen symptoms.

I sometimes think that of the great systems of the body it is the respiratory which has lagged behind in spectacular methods of treatment, for though the amelioration of tuberculosis of the lung is much for which to be thankful, the method is, broadly speaking, the same as that practised in the sunlit groves of a Greek temple; only now instead of worshipping Æsculapius, we kneel to the great god Laboratory. Pneumonia still, by right of facts and statistics, bears the title of Captain of the Men of Death, originally given to it by John Bunyan, and a careful study of the literature, especially that pertaining to the use of serum in this disease, does not convince me that treatment has improved in the last half-century. Expectant treatment, which means carefully observing and assisting the various processes by means of which immunity is eventually established, goes on quietly saving lives, whilst one after the other of the so-called specific treatments arise, with a flourish of manufacturer's trumpets, and all too soon, in relation to the expectations aroused, pass into the limbo of forgotten things. When people lived normal, out-of-door country lives, pneumonia, and to a greater extent still, tuberculosis, were not common diseases, but when they herded together into factories at the end of the eighteenth and the beginning of the nineteenth centuries, and the townships, which are now blots on the surface of the earth, formed themselves, tuberculous disease, especially in the lungs, spread like a forest fire. The greatest contribution of medicine towards the defeat of this disease has really been an endeavour to put people back into the country for a longer or a shorter period of time, and gradually to teach the people to say, with John Donne, that "cities are sepulchres and they who dwell there are carcases."

In the treatment of pneumonia, one should use morphia in the same way as a revolver, that is to say, never until it is necessary, and then properly; for both morphia and the revolver, if properly used, need not be employed again. One night's rest and freedom from pain, following the exhibition of an adequate dose, is far more helpful than the partial relief to be obtained from repeated small doses. For the early stages of pneumonia, as well as for large areas of pleurisy, our two most valuable and safest therapeutic aids are morphia and leeches, but

for æsthetic reasons the latter are far too little used. Some while ago I came across an old leech woman who for many years had made a good living from a leech farm somewhere down in the Cotswolds. She was now living on an old-age pension, and bereft of other means of resource, because the fashion for the use of leeches has so completely disappeared. I do not know whether she was a typical *laudator temporis acti* but she told me that leeches had joined in the general decay of the world, and no longer bit or swallowed as they used to do. My own impression is that the leeches we used in the hospital ten or fifteen years ago were better at their job than those which to-day I occasionally hire from the chemist.

MECHANICAL ASSISTANCE TO DIAGNOSIS

"In the early diagnosis of empyema, radiological signs are inferior to physical signs, and in three of our cases pus was aspirated from the pleural cavity on clinical grounds before any change was demonstrable in the X ray film." I take this sentence from a recent and valuable article on the pneumonias, which appeared in THE LANCET, for there is a widespread and childlike faith in X ray examinations, many regarding such examinations as infallible. Claude Bernard, the French physiologist, used to say that when you meet with a fact opposed to prevailing theory you should adhere to the fact and abandon the theory, even when the latter is suggested by great authorities and generally adopted—but it is of imperative importance in medicine to be certain of one's facts. I have seen an obvious case of pneumonia denied its correct diagnosis because an X ray examination revealed nothing, and it was only after considerable probing that it was found that the picture had been taken with the wrong type of tube and was therefore useless. Similarly, I have heard of an obvious case of typhoid fever being deprived of its name because an agglutination test was negative; which reduces enteric from the status of a syndrome to that of a peculiarity and particularity of a given specimen of blood-serum. It is more important to delineate a likeness when making a diagnosis than to allow treatment to await the result of a bench test.

When the radiograph first came into general use, the older and wiser physicians fought a rearguard action against too rapid a surrender of the individual's skill in examining by sight and sound but much of this teaching has died with the teachers. The X ray is of such supreme value in so many differing conditions, that we must needs remind ourselves that it is not infallible, and that the attainment of skill in auscultation and percussion, which in its apotheosis takes many years, is still necessary. The man will always beat the machine except when reason is deserted and faith only remains. Then, just as in the days of Laennec's stethoscope, the magic tube will be invested with healing as well as with diagnostic properties.

Emerson's statement that the end of the human race will be that it will eventually die of civilisation has a particular bearing also upon the science of medicine, for in every sphere the replacement of the man by the machine must eventually result in sterility. It is therefore of interest to learn that various teaching centres are now inaugurating lectures and courses in the science of medicine, for there are at last a few people who are beginning to realise that there is little value in the student who can discourse learnedly on the hydrogen-ion concentration of the blood, and yet cannot, by the naked eye, differentiate between a nephritic and a diabetic urine. More reliance upon the use of the eyes and the fingers, and less upon the laboratory, will pay us a dividend of success both in diagnosis and treatment, and to further this end I think that a general practitioner should be appointed to give lectures in every teaching hospital.

¹ Abstract of an address delivered on Feb. 27th, 1936, before the Hunterian Society of St. George's Hospital.

The only times that a physician should close his eyes are when he is using a stethoscope or palpating, for if the mechanism of the sense of sight is temporarily not used, the other senses gain in acuity. Usually it is as well to watch the patient's expression during the whole course of the examination, but as neither the stethoscope nor the bulbs of the fingers (never use the tips) are productive of pain, it is infinitely worth while to become momentarily blind, for then all things, such as diastolic murmurs and liver margins, shall be added unto you. In a famous book on diseases of the gall-bladder, it is stated that a physician literally carries his brains at the tip of his fingers, which is delightful, and in the case of many physicians whom I know would be, from the point of view of quantity, more than a possible conception: but such statements strengthen one's opinion that the word "literally" is responsible for even more lapses in literature than the much-abused words "unique" and "meticulous."

"Look before you feel" should be one of the frequently recurring texts of anyone who aspires to teach medicine. The novice and the indifferent doctor always press, probe, and pummel as the first step to a diagnosis, and this way disaster lies. The clue to the inflamed appendix is found by noting the restriction in the movement of the abdominal wall, not in the imposition of two hundred pounds of doctor on to the patient's belly, accompanied by a naive inquiry as to whether it hurts. Often the presence of blood inside the peritoneum can be deduced from a small area of bruising appearing on the abdominal skin. Such a sign is sometimes difficult to see unless the whole abdominal wall is examined with a strong light, but when found it is very suggestive, and may indeed be pathognomonic.

THE DIAGNOSTIC VALUE OF PAIN

It is never too late and never too early to remind ourselves how deceptive may be the site of pain. Many people who suffer from pain in or over the heart are convinced that they have some fell cardiac disease and they are too frightened to consult a doctor and to learn the truth, which is that cardiac pain is more often a symptom of disease in the gall-bladder or liver than in the heart itself. The reverse, of course, also holds true, and for example pain in the lower jaw, usually the left side, may be a sign of heart disease, as also may be the sensation of having a lump in the gullet. One perhaps need not hasten to add that in themselves neither of these signs is of any value, and is only to be taken in conjunction with all the minutiae which go to make up a clinical picture and so point to the diagnosis. When a patient comes into my consulting-room complaining of a pain in the heart region, I lay myself long odds against the presence of any cardiac lesion. Shortness of breath, swelling of feet, irregular pulse, indigestion, blueness or clamminess of the skin, nausea and giddiness, mental change, and a thousand others, are the complaints of heart cases. It is astonishing how badly disorganised a heart may be without giving rise to pain. The inevitable exception, of course, is furnished by angina, and there, though the pain is absolute agony, the fear of impending, sudden, and dramatic death is even more alarming.

It is very important to differentiate between gall-bladder disease and affection of the coronary arteries, which is sometimes more difficult than it sounds. Nearly 50 per cent. of cholecystitic cases, whether or not complicated by the presence of stones, give a story of more or less pain in the heart. This awareness of the precordial region may show all degrees from occasional palpitation to attacks of pseudo-angina. If evidence incriminating either the gall-bladder or the vascular supply of the heart is hard to evaluate, help may often be obtained from an electrocardiograph where the presence of a flattened or inverted T wave may aid in the differential diagnosis, and in so doing will furnish us with one of the comparatively rare occasions in which an

electrocardiographic tracing is of practical value in general medicine.

It is probable that a really acute attack of sciatica furnishes the most agonising pain to which a healthy man or woman in comfortable circumstances is liable, and I still think that in spite of many other vaunted remedies the best treatment is to give morphia, a quarter of a grain, repeated perhaps for three nights in succession, and that this treatment will sometimes see the end of an attack. There is no reason to suppose that the drug has any specific effect upon the inflamed nerves, but it gives rest to the tortured body, and in this rest the affected nerves must share. Old-fashioned but still popular textbooks, warn us against prescribing morphia in such cases, but I think their authors forget that it is to all intents and purposes impossible for a layman to obtain morphia and therefore the risk of causing an addiction is minimal, and it is my firm belief, from experience in my own practice, that the easily obtained barbiturates are far more dangerous and much less effective as a prescription.

[After some shrewd remarks upon influenza as seen in private practice, when the characteristic features of the pain must be noted, Dr. Howard went on to say that there may be a diagnostic sense enabling some to escape the danger of prescribing the wrong drug or making mistakes in dosage, but the allergic states constitute, he pointed out, a real danger which may beat the prescriber of the most simple drugs. He said:—]

Quinine is a common offender, but I think the most poisonous substance I have come across when ingested by a particular patient, was any form of potato. Even minute quantities, used for instance to thicken a soup, produced immediately profound collapse. Potato is not common, but eggs are quite common as instigators and inciters of these anaphylactic reactions, and no amount of desensitisation appears to have more than a temporary effect. Another drug commonly giving rise to untoward reactions is iodine, and now that in various forms it is widely advertised for external application, and that to its very presence next to the skin in the form of a locket or socks is being attributed a miraculous healing power, it is well to remember that even in minute quantities iodine may be a poison. If only a slight susceptibility exists, nothing but a running nose and red eyes may be noticed but a more pronounced reaction may be evidenced by a severe rash covering all the surface of the body. Iodine is excreted as iodide in the urine, sweat, saliva, milk, and the secretions of most of the glands, and there is a curious fact to remember, that the intensity of the reaction is often inversely proportional to the amount absorbed. People object to the administration of drugs which upset them or which give them an ugly, spotty, and blotchy skin, but it is not until one has examined a good many patients for a good many years that one begins to realise how rare it is to see a really lovely skin. The woman patient who had the most perfect skin I ever saw was almost a moron, so presumably the ectoderm exhausted itself on its attainment and had little left in hand for the highest nerve centres.

Itching of the skin is difficult to treat and is not a very common complaint, though of course localised itching, such as pruritus ani, is a very common complaint. It is usually badly treated and the patient continues to excoriate himself until a second infection is superadded and the misery of itching is intensified by the presence of discharge. The rational treatment consists first in the cure by injection of any internal hæmorrhoids, and the diminution of local congestion consequent upon this step leads in about half the cases to a cure of the pruritus. If, however, the skin, by scratching and secondary infection is hypertrophic and obviously involved, the whole area should be painted with solution of camphor and iodine in spirit until it becomes harder and less inflamed. Then a few injections of benzyl

benzoate in oil may give relief. This relief is likely only to be temporary unless the peri-anal skin is treated carefully for at least a year. There are many varieties of continuation treatment, but the most effective of the important directions are, first, that the area must be washed after every motion, and then La Rola must be carefully rubbed in. This is a patent preparation for which I can find no substitute. Every night the area should be dabbed with witch-hazel. No powder of any sort should be allowed and no dietary rules, except of course in the case of diabetics, are of value. All ointments are useless, but in some cases amazing relief can be given and permanent cure obtained by extracting 2½ c.cm. of blood from a vein in the anti-cubital fossa, mixing it with an equal amount of 2 per cent. novocain, and injecting it carefully, subcutaneously, into the peri-anal area. Personally I think that auto-hemotherapy in its varying forms is far too little used in England, and for various diseases of allergy, and for such conditions as migraine, and for vague forms of petit mal, it offers a useful field of therapeutic endeavour.

COSMETIC SURGERY

I confess that as yet I do not consider that æsthetic shortcomings fulfil the conditions which should be present before the continuity of the flesh is broken. At a clinic in Paris I have seen queues of middle-aged women, all of whom had recently had their faces lifted, their noses altered, their eyelids tightened, or their breasts raised. With the Psalmist they might inquire of Providence for how long they had recaptured a faint semblance of youth, for at best the fancied improvement can only be obtained for a very few years. When I asked some of them their reason for submitting to these painful manoeuvres they rather archly replied that it was a question of *l'amour*, but I rather fancy that *amour propre* is a better reason, because there is something in the misfortunes of our friends which is not displeasing to us

POPULAR MISCONCEPTIONS

It would be impossible to enumerate all the popular misconceptions about the functioning of the body, but the following are a few to which many people still cling with conviction and sometimes emphasis.

(a) That insomnia is dangerous to health and leads to mental exhaustion and insanity. There is no jot or tittle of proof that such is the case, and though bodily rest is essential, mental oblivion, even apparent, is not necessary to recurrent and adequate activity of the mind. The amount of sleep required by a given organism varies between very wide limits. The best brain workers and those who by the world's standards are acclaimed as great, often sleep very little. I am not in the least advocating less sleep, but you will be told by your patients that insomnia is necessarily harmful, and this is a boggy that should be laid.

(b) That overwork leads to a nervous breakdown. Brain work itself never leads to any damage of the nervous tissue, but five minutes' fear, or a day's worry, which is civilisation's substitute for fear, may affect a person permanently and irreparably for the worse.

(c) That a carefully planned diet is essential to health. With obvious exceptions, such as sufferers from diabetes or peptic ulcers, the ordinary mixed diet provides such a wealth of the necessary factors, including salts and vitamins, that any alteration is much more liable to do harm than good. It has only lately been shown that it is possible to have too many vitamins, just as it is possible to have too few, but only those unfortunates who exist on the hunger line need fear that that great chemical synthetic machine, the body, will be unable to extract from the ordinary mixed diet exactly what is required for the complete and proper functioning of each and every organ.

(d) That modern life is too strenuous. Hueffer once wrote a book called "Ladies Whose Bright Eyes," and in it gives a good picture of the rigours of the Middle Ages, and the largest executive in the biggest office, surrounded by twenty telephones and a hundred typists, will be less fatigued at the end of the day than the same

man would be after five minutes in the galleys, or an hour at the court of Imperial Spain.

(e) That, and it is a most popular misconception, constipation is the root of all evils. Except in the rarest cases, the sequels of constipation are all subjective phenomena, and the headache and the lassitude are entirely due to self-suggestion. The mass suggestion of the advertisers is a sufficient reason for the auto-suggestion.

Some of your patients who fancy that they suffer from any of these five health misconceptions will want you to advise treatment at a spa. The habit of going to a spa to undergo what is optimistically known as a cure is probably a survival of the days when magic healing properties were attributed to certain places, often wells or springs situated, preferably, in a part of the country difficult of access. To make a pilgrimage in search of health is a real exercise, and the necessity of taking certain steps and of undergoing certain ritual performances fixes the idea of a cure so firmly in the sufferer's mind that the stage is set prettily for the worked for and expected result. An odd commentary on spas in general is provided by the fact that the inhabitants of such places seldom, if ever, drink the nauseous waters or undergo the ritualistic ablutions themselves, but perhaps like Jeremiah they question whether there is any balm in Gilead. To Jeremiah's further question as to the presence of a physician they can return a strongly affirmative answer, for in this respect as a profession we retain a trifle of our priestly function, and the healing waters cannot usually be obtained, externally or internally, without the *laissez passer* of one of the many spa doctors. I suppose that for people of a gouty and plethoric nature some temporary good must come from an annual pilgrimage to a place where diet and régime and magical waters are to hand, and the yearly treatments may do something to delay what one writer has so aptly called that slide in ugly anguish from vaccines and bedpans to the tomb. Having, for my sins, smelled the waters at some spas both at home and abroad, I confess that I find a feeling of great sympathy for Samuel Butler when he said that "when the water of a place is bad it is safest to drink none that has not been filtered, either through the berry of a grape or else a tub of malt. These are the most reliable filters yet invented." When, however, patients are becoming a nuisance and are wearying, it is one way of escape to send them to a spa.

I have noticed that clever people are usually fools about their own health. The nice clever people, those who have great gifts and an accompanying simplicity of soul, fall into the hands of charlatans and dishonest healers because, knowing nothing of objective pathology, they will accept any statement or treatment which the quack likes to suggest. One can love this type even though at times a considerable irritation is produced by some further piece of evidence of stupidity. The difficult and rather worthless type is the successful, usually rich, person, who having differentiated himself from the common herd by the amassing of money, or the purchase of a title, must needs be individual in his therapeutic adventures. The common basis for the absolute and stupid faith which such a man exercises in respect to some new treatment is conceit, for he cannot bear to be as other men are and must always know better than the ordinary mortal. Examples of this stupidity, of this Athenian demand for some new thing, are so numerous that I will not attempt to chronicle them, but every practitioner probably hears of a case of this sort about once a month; such as that of a patient who after a colostomy for an inoperable growth goes to a quack, and as a result attributes his improving health to the new remedies and not to the cessation of septic absorption and of obstruction consequent upon his colostomy. During this brief period of feeling better he harries his friends until they too are shepherded into the false fold. Then when the growth slowly progresses and the sufferer, after going more or less rapidly downhill,

crawls away to die quietly, he is either too ashamed or too callous to revoke the glowing testimonials he had previously broadcast.

Dr. Howard concluded with some amusing examples of the distrust among medical men of innovations, and the confidence of the public in the veteran practitioner. These people, he said, are apt to exclaim with Oliver Wendell Holmes that "Age lends the graces that are sure to please." I looked up the rest of the quotation and have now memorised it as a retort when I am next told that an older doctor is preferable, for I find the ensuing line is, "Folks want their doctors mouldy, like their cheese."

PSYCHOLOGY FOR MEDICAL STUDENTS

ADDRESSING the Medical Society for Individual Psychology on March 12th, Sir WALTER LANGDON-BROWN spoke of the efforts being made to provide medical students with a basic training in psychology. The Curriculum Conference, of which he was a member, reported last May in favour of an elementary course of lectures towards the end of the preclinical period. The lectures at this stage, said Sir Walter, should bring the facts of psychology into relation with the student's own attempts at adjustment to daily life and environment, and they should be given by a medical man rather than a pure psychologist; for in T. A. Ross's words, "it would be extremely easy to ensure hatred of all psychology if the student were put through a serious course of academic psychology." Later, when he reached his clinical period he must be prepared to realise that imagined ills required, equally with organic ones, investigation and treatment. Such investigation and treatment called for simpler, more practical, and less specialised methods if they were to be of any subsequent value to the general practitioner. Not all mental and psychological conditions, of course, were suitable for treatment by the practitioner; the psychotic patient was often inaccessible and an obsessional state often required long and specialised treatment. But an understanding of all neuroses and psychoses, and a practical knowledge of how to treat the main bulk of neuroses with which he would later have to deal in general practice was essential for the medical student.

The conference had recommended the continuance of demonstrations in a mental hospital, but emphasised the importance of making a student familiar with the psychological aspects of *all* patients. Demonstrations should be held—by physician, surgeon, or psychologist—at least once a fortnight throughout the student's period of in-patient clerkships, and in this way the teacher of medical psychology should be able to draw upon the material in the hospital as a whole. The teaching of this subject should be woven into the ordinary teaching of medicine and surgery, and it was important that the teachers should approach their subject free from the trammels of pre-war materialistic medicine in which most of the present generation were brought up. The stimulus to provide a broader and more psychological approach to medicine was not only desired from students of psychology and reasearch; the pressure to teach the neuroses is coming from below; the students themselves were eager for it, and if they did not get it from one school they would go elsewhere.

In the subsequent discussion Dr. EDWARD MAPOTHER criticised an assumption implicit in Sir Walter Langdon-Brown's thesis—namely, that the psychoses and neuroses were two separable and distinct entities. This was not generally accepted; indeed there were good reasons why the study and perhaps the practice of the two should proceed by coordinated and coöperative methods.—Dr. HENRY YELLOWLEES maintained that the psychiatrist was in fact already successfully engaged in dealing with mental disorder of all kinds whether neurotic or psychotic. Treatment of the neuroses did not postulate a different method or viewpoint from that

of the psychoses, and there were many instances of a little knowledge being a dangerous thing.—Dr. T. A. ROSS expressed general agreement with Sir Walter's views. Many neuroses were aggravated by the accumulation of biochemical and other physiognostic data; it would be in the interests of all concerned to have the simple teaching methods applied which the speaker had described.—Dr. DAVID FORSYTH said that the methods advocated had the virtue of assisting the future medical generation to correlate the old with the new concepts in medicine.

Dr. MARGARET LOWENFELD said that experience of child psychology confirmed the urgent necessity for a new viewpoint in the treatment of nervous disorders in children.—Dr. A. T. WILSON doubted whether it was possible to teach a new mode of approach to anyone confirmed in a mechanistic philosophy of causation. Preclinical teaching should be behaviourism; the bias at present was towards the analytic—Dr. R. A. NOBLE pointed out that one of the intentions of the Curriculum Conference was to add to the existent demonstrations of and lectures in psychiatry; not in any way to replace them. Physicians' distrust of psychology would be dispelled by a recognition of the fact that to be a good medical psychologist a man must primarily and essentially be a good physician.—Dr. C. M. BEVAN-BROWN, the chairman, said that Sir Walter's propositions were generally those for the advocacy of which the Society stood. For their satisfactory achievement it would be necessary to destroy, or at least modify, the mechanistic concept. The difference between the old schools and the new was fundamentally a difference of philosophic standpoint. Hitherto the materialistic standpoint had been predominant.

AIR RAID PRECAUTIONS

IN connexion with the measures being taken to mitigate the effects of possible air-raids, the Order of St. John of Jerusalem and the British Red Cross Society have agreed to place their organisations at the disposal of both central and local governments in order to supplement official resources. We understand that the St. John Ambulance Brigade have issued a special order to their divisions all over the country making provision for the training of (1) instructors, (2) the existing rank and file of the Brigade, and (3) the general public as an auxiliary reserve. The British Red Cross Society, through its county branches, is taking similar action. Already, it is stated, over 900 officers of the Brigade, many of them medical men, have been through intensive courses of instruction in London, and many of these, having obtained their instructor's certificate, are conducting classes elsewhere. The British Red Cross Society have many hundreds of officers who are also qualified to instruct. The demand for these trained men and women is said to be rapidly increasing, for the medical officers of health of boroughs and urban districts have been officially advised to organise first aid and decontamination posts in their areas, the personnel of which will be voluntarily supplied by these trained members of the St. John Ambulance Brigade and the British Red Cross Society. Those taking the courses of the Brigade and the Society undergo examination and receive certificates. Subsequent examinations are held to ensure continued efficiency.

HYGIENE IN BRIEF

A CRITICISM often levelled at the study of preventive medicine is that, though vitally important and necessary, it is generally dull. It is thus satisfactory that however listlessly the reader may take up the authorised text-book of the St. John Ambulance Association,¹ he will be interested in spite of himself for it is packed

¹ Hygiene or the Gospel of Health. The authorised text-book of the St. John Ambulance Association. Third edition. By Neville M. Goodman, M.D. Camb., D.P.H. Lond., Lecturer and Examiner for the St. John Ambulance Association; Lecturer in Public Health and Sanitation, the London Hospital, London: St. John's Gate, Clerkenwell, E.C.1. 1935. Pp. 195. 1s. 6d.

with meat from start to finish, prepared in a palatable and digestible form. Dr. Goodman is a sane optimist. He believes, with Dr. Alfred Cox, that health can be bought and that it is not the people who make the slums. It is hard to choose quotations where so much is worth quoting, but two examples of his pithy utterances may be given. "An Englishman's home is said to be his castle; it should at least be a healthy, modern one, not an insanitary mediæval ruin." And again, "The good housewife must know where to draw the line between making her home a kind of museum of cleanliness and a slovenly abode of dirt. At either extreme her husband and family will only return home with reluctance." Appended to each chapter is a questionnaire which can be answered from the text and should prove useful to examinees.

WHITAKER'S ALMANACK

THE new edition of Whitaker's Almanack not only contains the new House of Commons and a conspectus of the National Government as reconstituted after the general election, but also the changes consequential on the death of King George V. and the accession of Edward VIII. The Almanack is thus so modern that we turned with misgiving to the title page with the signs of the zodiac, to find with relief that it remains as it always was. The Almanack is still the completest guide we have to the activities of our fellow human beings and might well be the most acceptable gift for anyone allowed to possess only one book and already familiar with the Bible and Shakespeare. By way of quotation a single item of curious information must here suffice. Contrary to general belief, of the 40 million inhabitants of England and Wales less than 1 per cent. were born in Scotland, while of the five million inhabitants of Scotland nearly 3.5 per cent. were born in England or Wales. Whitaker can be relied upon to refute many other well-worn fallacies. The price is 3s. in paper cover and 6s. in cloth.

Vacancies

For further information refer to the advertisement columns.

- Barnsley Municipal General Hospital.**—First Asst. M.O. £650.
Belgrave Hospital for Children, Clapham-road, S.W.—Two H.P.'s and one H.S. Each at rate of £100.
Birmingham, Canwell Hall Babies' Hospital.—Res. M.O. At rate of £250.
Birmingham City.—Sen. Asst. M.O.H. £750.
Birmingham City, Maternity and Child Welfare Dept.—Three Temp. M.O.'s. Each £10 per week.
Birmingham, Queen's Hospital.—Bacteriologist and Clinical Pathologist. £600. Also Res. Surg. Reg. £125.
Bolton Royal Infirmary.—H.S. £125.
Brighton, New Sussex Hospital for Women, Windlesham-road.—H.P. £100.
Bristol, Brentry Colony for Male Mental Defectives, Westbury-on-Trym.—Res. Med. Supt. £650.
Bristol, Ham Green Hospital and Sanatorium.—Jun. Asst. Res. M.O. £250.
British Postgraduate Medical School, Ducane-road W.—Three H.S.'s.
Burnley, Victoria Hospital.—H.P. At rate of £150.
Cambridge, Addenbrooke's Hospital.—H.P. Also H.S. to Special Depts. Each at rate of £130.
Cardiff Royal Infirmary.—H.S. for Ophth. Dept. At rate of £40.
Chester, East Lancashire Tuberculosis Colony, Burrowmore Hall.—H.P. At rate of £150.
Cumberland County Council.—Asst. County M.O.H. and District M.O.H. £800.
Durham County Mental Hospital.—First Asst. M.O. £594.
Eastbourne Royal Eye Hospital, Pevensey-road.—H.S. £100.
Exeter, Royal Devon and Exeter Hospital.—H.S. to Ear, Nose, and Throat Dept. At rate of £150.
Golden-square, Throat, Nose, and Ear Hospital, W.—H.S. £100.
Gordon Hospital for Rectal Diseases, Vauxhall Bridge-road, S.W.—Res. H.S. £150.
Gravesend and North Kent Hospital.—H.S. £125.
Greenwich Metropolitan Borough.—M.O.H. £1100.
Harrogate and District General Hospital.—Hon. Physician.
Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—Res. Surg. O. £150. Also Asst. Res. M.O. and 3 H.P.'s. At rate of £150 and £50 respectively.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O. Also H.P. At rate of £150 and £100 respectively.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.S. At rate of £75.
Huddersfield Royal Infirmary.—Cas. O. £200. Also H.P. and Res. Anaesthetist. £150.
Hull Royal Infirmary.—First H.P. At rate of £175.
Iford, King George Hospital.—H.P. and two H.S.'s. Each at rate of £100.
Infants Hospital, Vincent-square, Westminster, S.W.—H.P. At rate of £75.
Ipswich, East Suffolk and Ipswich Hospital.—H.S. £144.
Kent Education Committee.—Half-time Asst. M.O. £350.
Laboratories of Pathology and Public Health, 6, Harley-street, W.—Third Asst. Pathologist. £450.
Leeds Hospital for Women.—Hon. Surgeon. Also Hon. Obstet. Surgeon.
Leeds Maternity Hospital, Hyde Terrace.—Res. Surg. O. At rate of £200. Also two H.S.'s. Each at rate of £75.
Leeds University.—Chair of Anatomy. £1000. Also Tutor in Obstetrics and Gynaecology. £500.
Liverpool Sanatorium, Delamere Forest, Frodsham.—Second Asst. to Med. Supt. £200.
Liverpool, Walton Hospital.—Res. Asst. M.O. £200.
London County Council.—Two Asst. M.O.'s (Grade II.). Each £250. H.P.'s. Each £120. Also Clin. Asst. £150.
L.C.C. Central Histological Laboratory, Archway Hospital, Archway-road, N.—Asst. Pathologist. £650.
London Lock Hospitals.—Two Res. M.O.'s. One for Male Dept. One for Female Dept. Each at rate of £175.
London University.—University Chair of Anatomy at St. Bartholomew's Hospital Medical College. £1000.
Macclesfield General Infirmary.—Second H.S. At rate of £150.
Maidstone, Kent County Ophthalmic and Aural Hospital.—Ophth. H.S. At rate of £200.
Manchester, Ancoats Hospital.—Res. M.O. At rate of £150.
Manchester, Booth Hall Hospital.—Jun. Asst. M.O. At rate of £200.
Manchester Royal Children's Hospital, Pendlebury.—Res. Surg. O. At rate of £125.
Manchester Royal Infirmary.—Registrar to Medical Out-patients. At rate of £150.
Margate, Royal Sea-bathing Hospital.—Asst. Med. Supt. £500.
Maudsley Hospital, Denmark Hill, S.E.—Asst. M.O.'s. Each £470.
Mount Vernon Hospital, Northwood.—Asst. Radiologist. £500.
National Hospital for Diseases of the Heart, Westmoreland-street, W.—Res. M.O. Also Out-patient M.O. At rate of £150 and £125 respectively.
Newport, Mon., Royal Gwent Hospital.—Cas. O. £175. Also H.S. £135.
New Zealand, Queen Mary Hospital, Hammer Springs.—M.O. £650.
Oldham Royal Infirmary.—Cas. O. and H.S. for Fracture Dept. At rate of £175.
Portsmouth Royal Hospital.—Cas. O. At rate of £130.
Preston and County of Lancaster Royal Infirmary.—H.P., Cas. H.S. Also H.S. Each at rate of £150.
Queen Mary's Hospital for the East End, Stratford, E.—Asst. Radiologist. £150. Also Obstet. H.S. £120.
Reading, Royal Berkshire Hospital.—H.P. Also Cas. O. Each at rate of £125.
Redhill, Royal Earlswood Institution.—Jun. Asst. M.O. At rate of £250.
Richmond, Surrey Royal Hospital.—Jun. H.S. At rate of £100.
Rochdale Infirmary and Dispensary.—Second H.S. £150.
Rotherham Hospital.—Cas. H.S. £150.
Royal Free Hospital, Gray's Inn-road, W.C.—Res. Cas. O. At rate of £150.
Royal National Orthopaedic Hospital, 234, Great Portland-street, W.—H.S. At rate of £150.
Royal Society, Burlington House, W.—E. Alan Johnston and Lawrence Research Fellowship in Medicine. £700.
St. Mary's Hospital for Women and Children, Plaistow, E.—Res. H.S. and Res. H.P. £155 and £150 respectively.
Salford City.—Asst. M.O. for Venereal Diseases Treatment Centre. £500.
Salford, Hope Hospital.—Res. Obstet. Officer. £400.
Salisbury General Infirmary.—H.S. At rate of £125.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. At rate of £100.
Sheffield Children's Hospital.—H.S. At rate of £100.
Shoreham-by-Sea, Southlands Hospital.—Second Asst. Res. M.O. £300.
Southend-on-Sea General Hospital.—Obstet. Registrar. £125.
South London Hospital for Women, Clapham Common, S.W.—Clin. Asst.
Surrey County Council.—Ophth. Surgeon. £750.
Swanley Hospital Convalescent Home, Parkwood.—Res. M.O. At rate of £200.
University College Hospital, Gower-street, W.C.—Hon. Clin. Asst. in X Ray Dept.
West London Hospital, Hammersmith-road, W.—Physician.
Wigan, Royal Albert Edward Infirmary and Dispensary.—Res. Med. and Surg. O. and Reg. £250. Also H.S. £150.
Wilkesden General Hospital, Harlesden-road, N.W.—Hon. Anaesthetist.
Yorkshire Children's Orthopaedic Hospital, Kirbymoorside.—H.S. £200.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Nelson (Lancs.).

SCARBOROUGH'S NEW HOSPITAL.—The new hospital at Scarborough, which is being built at a cost of £128,000, is to be opened in September. Between £12,000 and £15,000 is required to meet the capital expenditure. Its maintenance cost will exceed that of the present hospital, but it is hoped that a new contributory scheme, which will bring in at least £3000, will make this good.

